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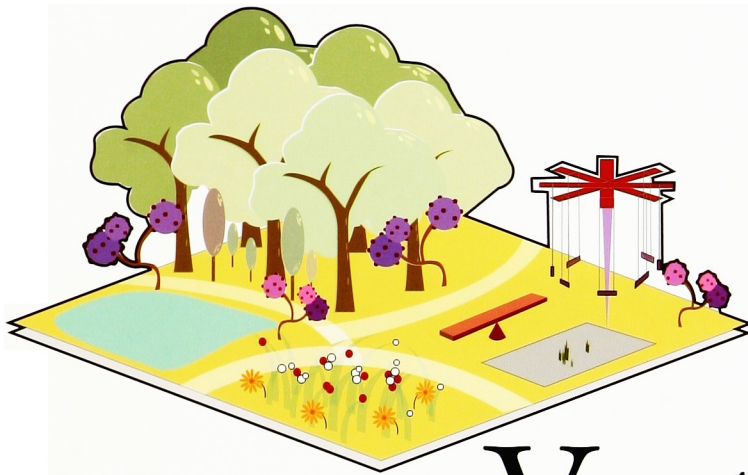
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# Vector Garden

Rochester Institute of Technology  
A Thesis submitted to the Faculty of  
the College of Imaging Arts and Sciences,  
School of Design  
In Candidacy for the degree of Master of Fine Arts

Submitted by: Hsieh Lichun  
Date: May / 2003



# **Vector Garden**

**<http://www.rit.edu/~lxh1820/>**

**By Lichun, Hsieh**

Rochester Institute of Technology

A Thesis submitted to the Faculty of the College  
of Imaging Arts and Sciences, School of Design  
In candidacy for the degree of Master of Fine Arts

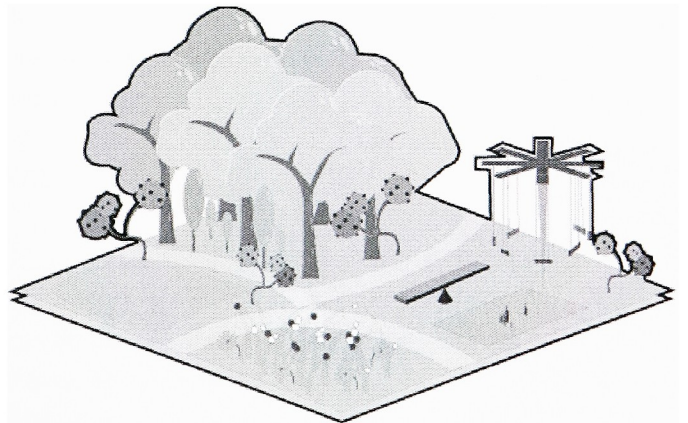
Title:

**Vector Garden:**

It is about creating a complex, dynamic,  
multidimensional and interactive visual  
fairyland where users can explore and  
experience what vector graphics could be in  
the world of web interface design.

Submitted by: Hsieh Lichun

Date: May / 2003



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May/2003

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## **Abstract**

Vector Garden demonstrates the vital role of vector graphics in web designing. Its purpose is to create a complex, dynamic, multidimensional and interactive virtual fairyland where viewers can escape into a creative world of imagination, hope and fantasy. Put together with Macromedia Flash and Adobe Illustrator, Vector Garden is a non-commercial online experimental design in the vector graphic style website design. By combining a variety of elements of both visual and audio designing, including typographies, colors, layouts, graphics, sounds and ActionScripts, it presents an underlying concept of Vector graphics, their applications in and relationships to the world of designing.

# Introduction

"To design is much more than simply to assemble, to order, or even to edit; it is to add value and meaning, to illuminate, to simplify, to clarify, to modify, to dignify, to dramatize, to persuade, and perhaps even to amuse."

Paul Rand,  
"Design, Form, and Chaos"

## Original

When I was young, I first read "Alice in Wonderland" by Louis Carroll, a story about a little girl encountering many animals in her dreams. I was so inspired by its unlimited creativity and vivid imaginations. Recently there is a Japanese cartoon movie "Spirited Away", which shares the same vision that a little girl accidentally discovers a secret world when she and her family get lost and venture through hillside tunnels. My project is to create a fantasyland that is full of fun, surprises and beauty. Through visual images, the viewers, without boundary, can escape into a creative world of imagination, hope and fantasy.

# Proposal

## *Problem Statement:*

Since its introduction to the public society, the information super highway incorporates huge quantity of motion graphics, animations, audio and video. It provides graphic designers extreme opportunities to explore, develop and utilize the potentials of graphic design in this new high-tech era. By employing different elements of visual design, including typography, color, layout, photography based on pre-determined settings, the best graphic designers can precisely deliver messages to, communicate and exchange information with the broad public.

Internet websites are so assorted, diverse and distinguishing from each other, serving different purposes, representing countless individuals and groups. Surprisingly, most website interfaces share similar standardized appearances, for the sole purpose of selling or promoting one particular good, either a service or product, to meet the needs of consumers and for the benefit of its suppliers. Without either party, those websites even do not exist. The primary priority is how much information is disseminated to entice the viewers/users so it could turn into a profitable transaction.

As for me, I do agree that this new device is so great for commercial uses. At the same time, I also strongly believe that graphic designing for the Internet can be of more humanized and individualized. It should correspond to our individual personalities, thoughts and behaviors; characterized by our very own preferences, and uniquely, of our own inner worlds.

## *Objective:*

My thesis is about creating a complex, dynamic, multidimensional and interactive virtual fairyland where viewers can explore and experiment the use of vector graphics in web designing. It is a non-commercial online experimental design and it is a vector graphic style website built with Macromedia Flash and Illustrator.

## *Target Audience:*

Vector Garden is for everyone but it mainly targets people who are in the design profession or related fields. It's also for college level students and those interested in designing with a computer.

## *The End Product:*

Vector Garden, an interactive website

## *Expected Software Used*

Macromedia Flash; Adobe Photoshop; Illustrator; SoundEdit.



## Summary

*Internet websites incorporate a huge quantity of motion graphics, animations, audio and video, providing graphic designers extreme opportunities to explore, develop and utilize the potentials of graphics in this new high-tech era. How do graphic designers employ different elements of visual designing, including typography, color, layout, photography based on pre-determined settings, to precisely deliver messages to, communicate and exchange information with the broad public?*

Even though we navigate daily through a perceptual world of three spatial dimensions, the world portrayed on our displays is caught up in two-dimensionality of the endless flatlands of paper or computer monitor screen. All communication between the readers of an image and the makers of an image takes place on a two-dimensional surface. Escaping this flatland is the essential tasks of envisioning information on the monitor screen.

To accommodate different speeds and to accelerate the transmission of the whole application onto the receiving terminals, vector graphics would be the most suitable choice. To create a more interesting environment, the interactivities adapted for user control is another crucial task for the website design.

Hence, my thesis will be the creation a complex, dynamic, multidimensional and interactive virtual fairyland where users can explore and experiment what vector graphics can do in the world of web interface design. It is a non-commercial online experimental design and it is a vector graphic style website built with Macromedia Flash and Illustrator.

# Research I

## (Before building the garden)

### *Overall*

Again, Vector Garden is a non-commercial online experimental design. No matter what kind of designing experience, such as new image creation or programming exploration, one aspect of an experience that can make it surprising and amazing is that of confronting one's beliefs. When the evidence in front of our eyes confronts our beliefs and expectations, we are challenged to rethink possibilities.

Similar to the fun and excitement of amusement parks, our feelings of excitement are always a result of exploring an unusual environment with fantastical features. Most amusement rides offer us the ability to experience things we could not otherwise, or play on our own senses in ways that would be difficult outside the parks. Rides that twirl us at high speed or lift us off the ground are usually novel and stimulate our emotions. Even walking around the park is often a visual, sonic, and olfactory treat, as well as see, and hear novel things created especially to grab our attention and enhance the experience.

In addition, an experience that tells us something about itself tends to feel more interactive than ones that do not. Whether the feedback is a simple explanation about why you are waiting, a reaction to some user action or a detailed accounting of the system's performance, most people expect the experience to acknowledge their actions in some way. It is important to give just the right amount of feedback because too little may not be helpful or frustrating, and too much may be overbearing and distracting.

Taking into consideration the purpose of my thesis, my target viewers, their possible level of acceptance and comfort, also other factors, I have simplified my research and will concentrate on the usage of visual images, sonic, environmental and interactive features provided for the viewers.

## Research II

### (Sketch the garden)

#### Vector Graphics

*"Vector graphics are wonderful for the Web. They're way more efficient than transmitting bitmaps and they scale perfectly to the wide variety of display sizes browsing the Web. They are a great tool in communicating clearly and elegantly through the Web, while still adapting to the viewer's browser window."*

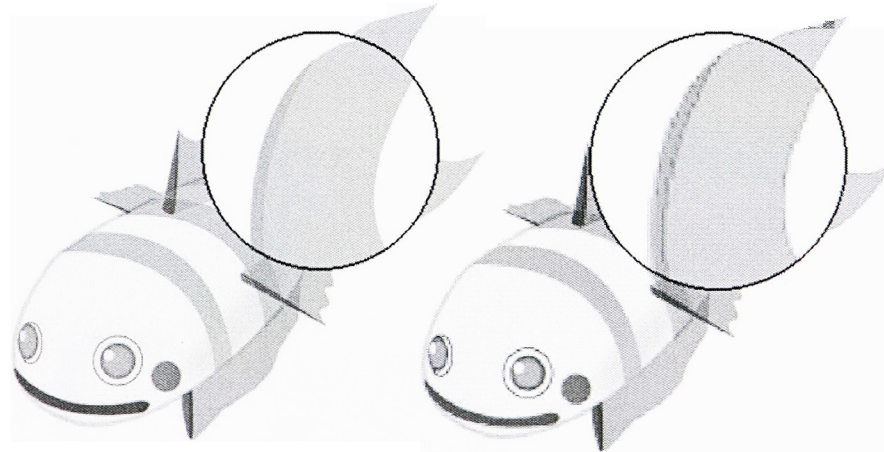
*Kevin Lynch,  
Macromedia's vice president*

*What is Vector Graphics?*

Vector graphics are just a form of image that can be displayed on VDTs (Video Display Terminals), similar to files in GIF and JPEG formats, which are made up of a set of pixels, with different colors, combining into patterns that make up images.

Vector graphics are a series of commands that can dictate a line's direction, thickness, and color, which are rendered on VDTs later. What makes them so distinctive and special? They can compose files that are very small, that can be sized to and in any proportion. They are also eminently flexible because they are easy to be re-rendered at any point.

(Figure 01: Vector Graphic and Bitmap)



Vector

Bitmap

*Vector Graphics Backward:*

However, vector graphics cannot match the realism of photographs with a line-drawn image. JPEGs still reign supreme for representing the real world. Vector graphics can only generate comic or cartoon-like drawings.

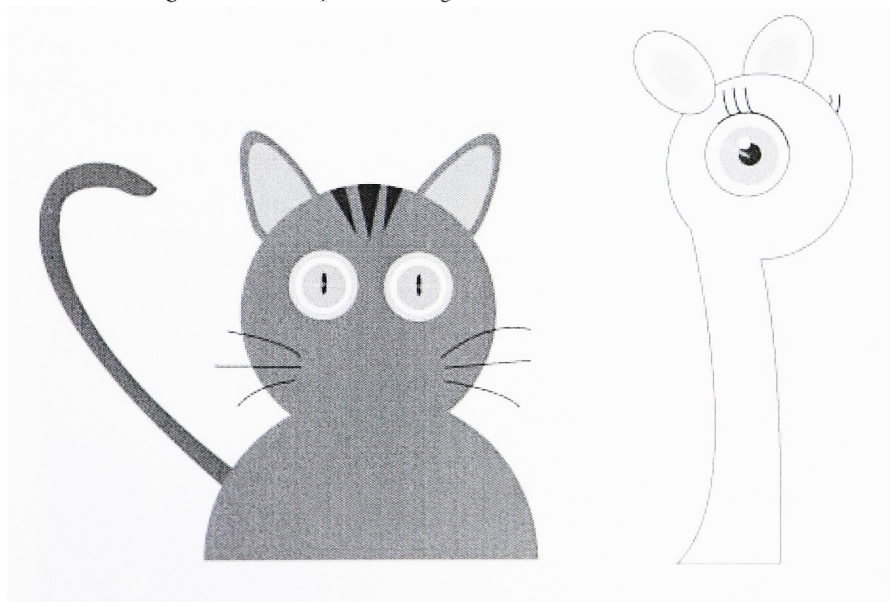
## Graphic Communication in Vector Garden

To circumvent the limitation of vector graphics, I have created many symbols to represent imagery, symbols that are characterized with their simplicity, various structures, scales and contrast.

Symbols can be used in a way of collapsing information into a much smaller form so that they are often used to demonstrate or illustrate a process, to deliver messages, to record, share and disseminate information, etc. What makes symbols powerful is their ability to transmit meanings under difficult circumstances, especially to across linguistic and language barriers. However, a symbol does not automatically possess the ability to communicate to everyone. Cultural differences make symbols, icons, and logo designing even more uncertain since they rely on much more shared texts than other forms of communications. Lack of understanding within a particular culture often causes designers to fail to communicate appropriately, also often to disseminate false or defamatory information.

One thing I am proud about the images I have created in Vector Garden is the reflection of my cultural background, with my very own personal thoughts, imaginations and ideas. We are all unique individuals. Sometimes it could be difficult to convey your own ideas to the others, but we have something in common that we all have our own dream worlds like my Vector Garden, and I would like to portray my own dream world through these images. I do not expect full consensus and understanding from my viewers, but I do believe that it is a very fascinating way to communicate through images.

(Figure 02: examples of images in Vector Garden)





## Color

Color I use in Vector Garden is to:

- a) To represent or imitate reality (color as representation)
- b) To enliven or decorate (color as beauty)

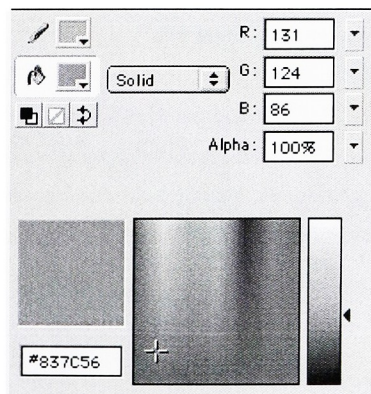
Some theories report that a good strategy on how to choose color is to use colors found in nature, especially those on the lighter side, such as blues, yellows, and grays of sky and shadow. Nature's colors are familiar and coherent, possessing a widely accept harmony to the human eye

(Figure 03: example of Nature's color)



"Third rule: Large area background or base-colors should do their work mostly quietly, allowing the smaller, bright areas to stand out most vividly, if the former are muted, grayish or neutral. For this very good reason, gray is regarded in painting to be one of the prettiest, most important and most versatile of colors. Strongly muted colors, mixed with gray, provide the best background for the colored theme..."<sup>1</sup>

[Eduard Imhof, cartographic Relief Presentation (Berlin, 1982), Edited and translated by H. Steward from Imhof's Kartographische Geländearstellung (Berlin, 1965), p 72.]

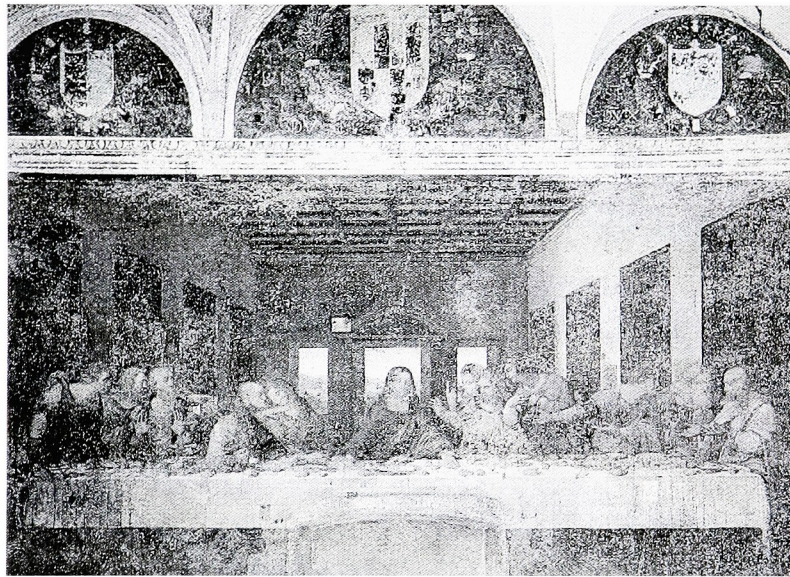


Similarly, in my project I use muted, grayish or neutral color for the background and large scale areas, and use more vivid, bright and active color for central parts or small areas (Figure 04: the color number I use in Vector garden in background)

## Timing

Timing and motion are the underpinnings of multimedia, video and animation. Timing makes digital media far different from traditional printed media. Traditional printed media has to utilize its limited space to tell stories, taking the Bible as an example. To accommodate those who are illiterate and to help them recognize the Christian spirit, Christians tried to tell stories of Jesus by two-dimensional paintings, on walls or in single pages of a book, that only visual sense received the information.

(Figure 05: Leonardo da Vinci, *The Last Supper* 1498 (180 Kb);  
Fresco, 460 x 880 cm (15 x 29 ft); Convent of Santa Maria delle  
Grazie (Refectory), Milan)



Nowadays, with advanced visual devices, we have become accustomed to “paintings” on screens with movement and sounds, controlled by timing. Those elements could create, even influence, moods and emotions instantly and immediately on our visual and sonic treat. For example, Alfred Hitchcock used timing and pacing in a film to create suspense in ways never previously conceived.

In Vector Garden, I have positioned slow randomly moving objects generated from Flash programming, or simply timeline-based movie clips to create a silent and mute virtual phenomenon. With relaxing music in the background, when viewers “enter” Vector Garden, they would feel like walking in a park, getting away from noisy cities and crowds. On the other hand, fast tempo music and fast movements are used in timeline-based animation sessions. First of all, I would like to isolate the main scenes (Eastpark, Westpark, Northpark and Amusement Area) from animation scenes (Dragonfly, Ladybug, Small forest, frog animation). Secondly, with rapid movements and tempo changes, dragonfly, ladybug and frog animation will bring the viewers the experience of a fantastic, remarkable and exotic fairyland.



## Sound

"Stretch sound to help the mind see"

-Walter Murch

Sound comes in a variety of forms that can be incredibly complex, rich, and often subtle. It is primarily to convey and receive data, information, and knowledge, or simply to communicate. While we can accomplish much of these through writing and reading (human eyes), most of our communications take the form of sounds. Visual media such as television programs deliver information through speeches, and other sounds, and express emotions through music. Certainly, there are compelling visuals that stimulate our emotions or convey information. However, it is almost impossible to turn off the sound of a television and be able to interpret the program accurately. On the contrary, it is much easier to interpret a program without images, for example: radio programs.

Choosing the sound in Vector Garden plays an essential role, especially in areas with animations. The sound will seize the attention of the viewers so that they would feel more like being in a fantastic and exotic fairyland. I have categorized the sound into four groups:

### *1) Background Sound:*

*{Orchid Island} vs. {Moonlight Festival} /*

*Wind Records Co., Ltd. Taiwan*

The background music is from two CDs titled "Moonlight Festival" and "Orchid Island", which recorded the lucid sounds from natural live environment, such as the sounds of frogs, crickets, squirrels and birds. Four melodies composed from different circumstances or creatures are chosen as background sound for each park. For example, the soundtrack mixed with the sounds of night forest, wind and crickets is used in Eastpark.

### *2) Animation Music:*

#### ***Jazz***

##### *a) Dragonfly Animation Background Music:*

*"Swing Etoile" / Swing Jazz*

*{Ben Rogers Hot Swing Quartet}*

##### *b) Ladybug Animation background Music:*

*Loop/ Jazz (Funky\_Li-Benjamin-1738.wav)*

*{www.mp3.com}*

The single core element in Jazz is a personal approach to improvisation. In the hands of a jazz musician, a rhythm, a melody, or a song is filtered through the singular style of the musician and becomes a personal expression.

Jazz musicians usually attempt to tell stories through music. Because a jazz musician is involved with improvisation and individuality, he/she will never tell the story quite the same way twice. The notes they play are intended to be as expressive as the rising and falling of a voice or of action during the telling of a story.

For the same reason, I have chosen Jazz as my dragonfly and ladybug animation, because both images are created in the ways of personal improvisation and individually to express my own thoughts.

### ***French Folk Music***

*{CDs: RETAGNE DE TOUJOURS vol 1}*

*c) Frog and Princess Animation background Music:*

*"No. 15: Hommage au pere jean"/ French Music*

*d) WestPark Animation Background Music:*

*"No. 1: divers chanteurs Hanter dro du Trebic/Buxus sempervirens" /*

*e) Quit Page Background Music:*

*"No.2: Pachpi"/ French Music*

French folk music is always so vibrant to me, alive and amazingly beautiful. It gives one new optimism, passion for life and love. The music I chose for the animations, first of all, is so optimistic without naiveté, uplifting with melodrama, inspiring without losing reality. The collaboration of the piano, mandolin, accordion (without which it would not be French music) and others are astonishing and perfect to listen to when in a creative mood. Secondly, the WestPark animation in Vector Garden was inspired by "Alice in wonderland" combined with my personal translation. The NorthPark animation, on the other hand, was influenced by a famous Russian tale story "Frog Princess".

*3) MovieClip Sound/ Button Sound:*

To personalize the movie clips and give them more characters, each button is assigned a unique voice.



## Space

### *Physical space of Vector Garden*

A garden could be of such large scale, I realized that it is more feasible to divide the interface design into four sections. Each of them individually depicts a typical area of that in a real garden. This helps me easily identify potential problems and timely address them with solutions of appropriate scale and interface design. These four areas are EastPark, WestPark, NorthPark, and, Amusement Area. Totally space in Vector Garden is:

1. Introduction Page (in)
2. EastPark (Insert Area)
3. WestPark (Forest Area)
4. NorthPark (Pong Area)
5. Amusement Area
6. Quit Page (out)

### *Visual Space*

Perspective using:

Perspective is a geometric method of representing on paper the way that objects appear to get smaller and closer together, the further away they are. When drawing anything, one must always consider solidity and surface bumps which can only be achieved when one knows the idea of Perspective. One must see through to imagine what is actually seen: The points where parallel lines vanish; the gradation of colors as the effect of distance; the highlights and shadows and its angles. As the object gets far from the line of sight, it becomes smaller and blurred until it appears insignificant. The color becomes lighter and the outlines indistinct. Therefore, Perspective drawing is crucial in effective freehand drawing and painting. Westpark could be one good example of how perspective is used to create spacing in Vector Garden. It is an easy way to deceive human eyes to represent three-dimensional world in a two-dimension screen.

## Interactive

Different experiences demand feedbacks at different rates. For example, most games require a great deal of feedback to keep the actions moving. On the other hand, relaxing experiences, such as my project Vector Garden or VectorPark ([www.vetorpark.com](http://www.vetorpark.com)) require only little feedback to make it a great success.

### *Three Styles of Interaction in Vector Garden*

According to Monkeymedia, interface elements separate into five families of interaction: discrete, continuous, concrete, character and resonant -based on the involvement they engender between participant and content.<sup>2</sup> Vector Garden interface elements use only three out of the above five interactive families - discrete, continuous and character.

#### 1) Discrete Interaction

Common examples of discrete interface elements are buttons, menus and some cursor-based tools. By pressing, clicking, double-clicking, dragging, scrolling and jumping, users can select, view, compare and present. They are in control of the pace. Nothing happens unless they say so, and when they do say so, they get immediate feedback.

#### 2) Continuous Interaction

Common interface elements in this family are animated cursors for spatial or temporal navigation. In this style of interaction, the attitude of the participant is rhythmic and tends toward casual or experimental. Participants may not know exactly where they are going or what is happening, but they are able to explore safely and return smoothly to their previous location. By doing "nothing", they exercise as much control over the pace as by moving the input device. By rolling, gliding, moving, pressing and holding, drawing and flicking, participants can browse, explore, visualize, simulate and perform.

#### 3) Character Interaction

In character interactions the participant is a player experiencing the world through, or with, a character who lives in the content space, often by manipulating the actions of that character. Thus, character interactions are literally second person. This style is often aimed towards children, in which case it relies on simple actions carried out with convincing animation. We may find, though, that a combination of concrete and character interactions proves useful in virtual spaces for all ages.

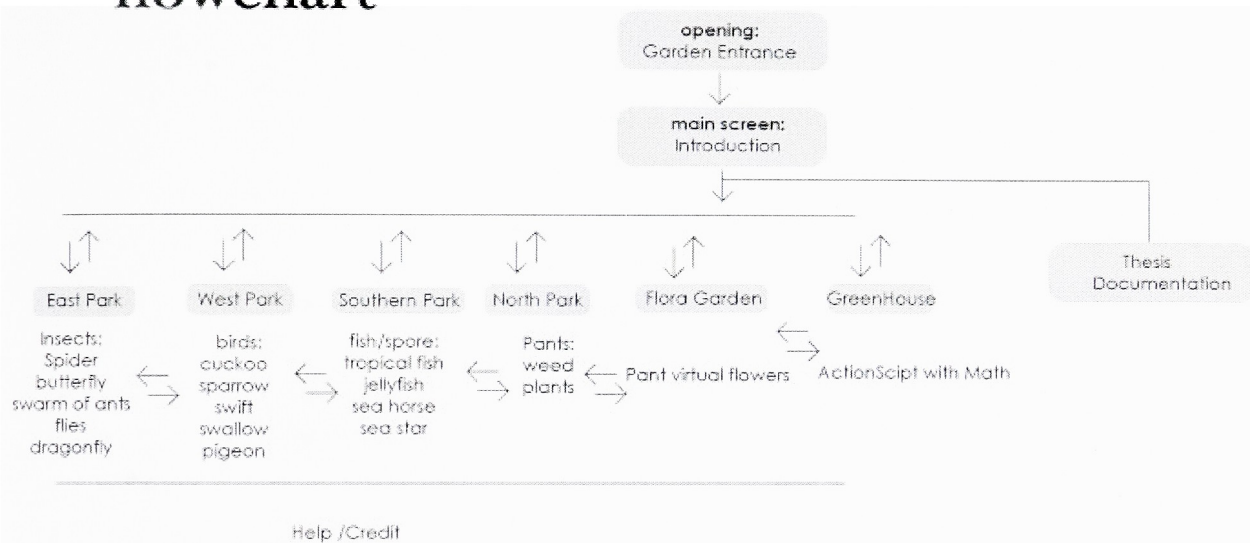
# Process

## Start building the garden

Architecture of Vector Garden

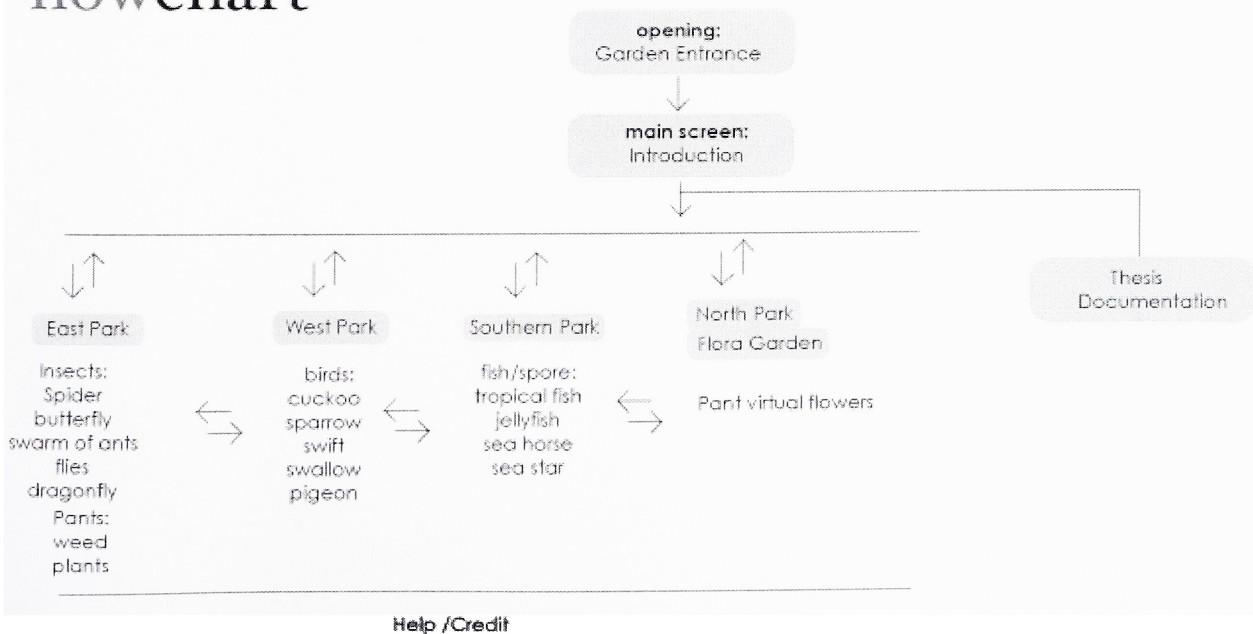
(Figure 06: Original Flowchart of Vector Garden)

# Vector Garden flowchart



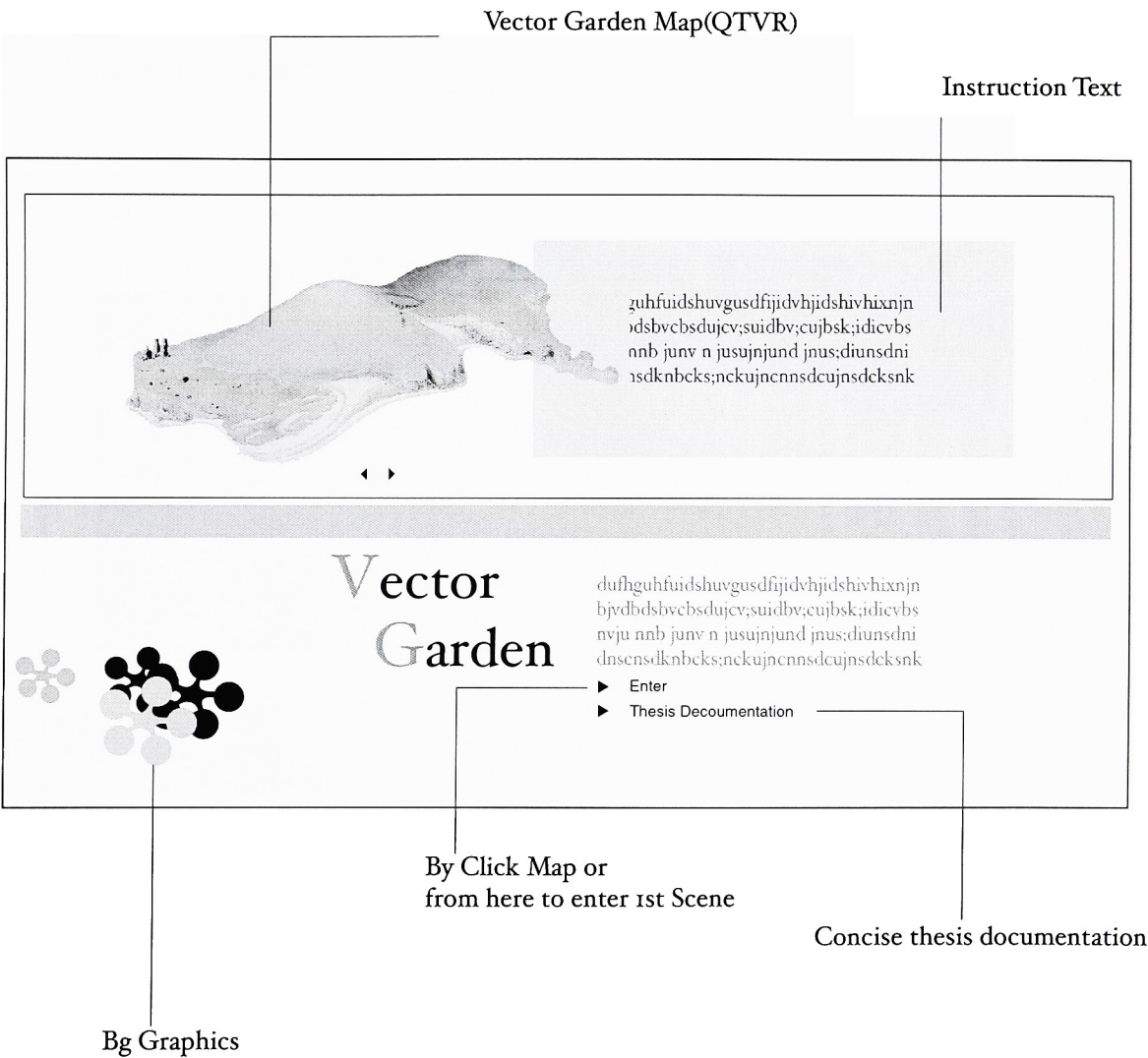
(Figure 07: Final Flowchart of Vector Garden)

# Vector Garden flowchart



(Figureo8: Original Storyboardor)

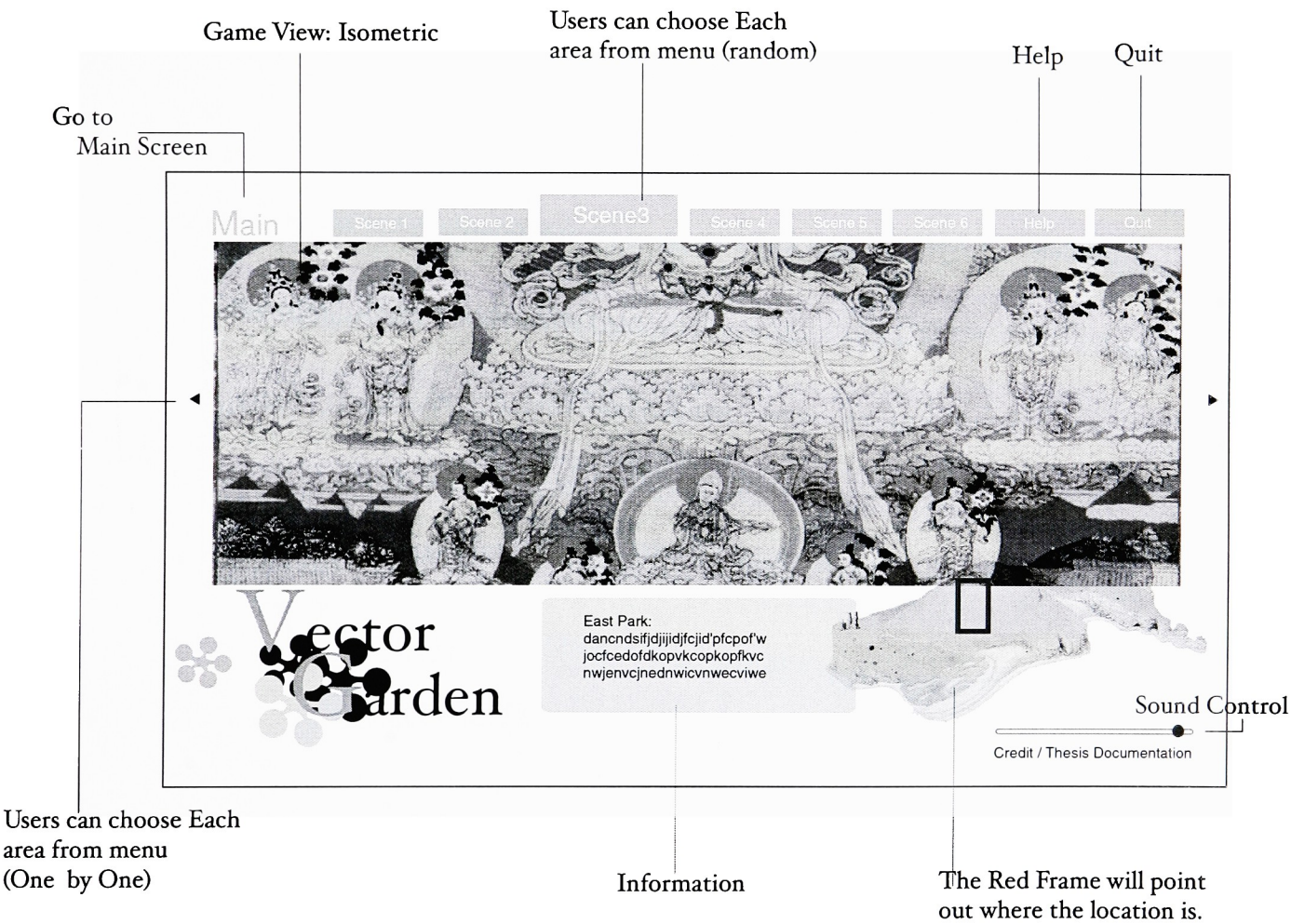
# 1. Main Screen





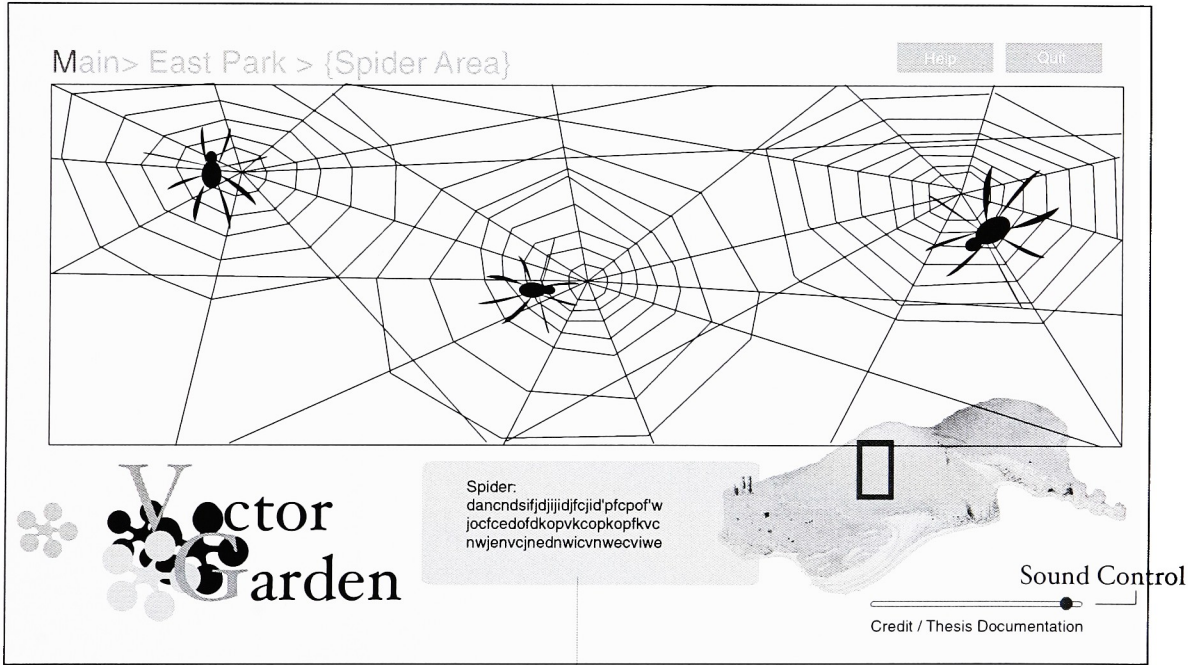
(Figure09: Original Storyboard02)

## 2. Each Area(6 Parts)



(Figure10: Original Storyboard03)

### 3. Zoom in

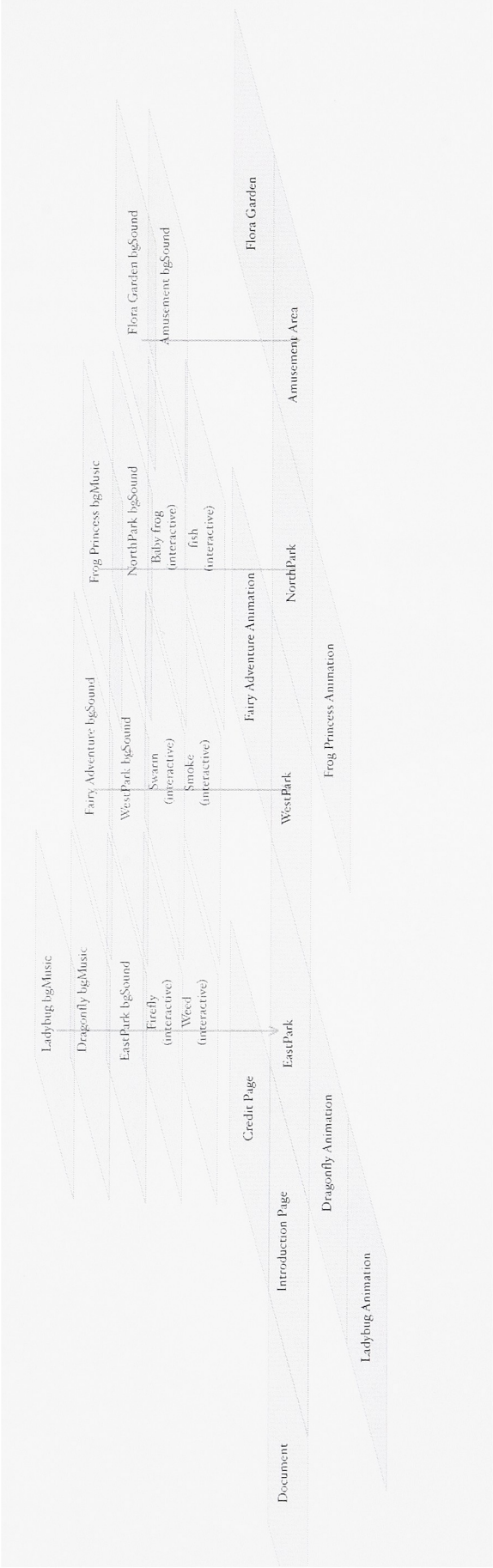


Information

(Figure 11: Component System Architecture of Whole site)

# Vector Garden

## Component System Architecture

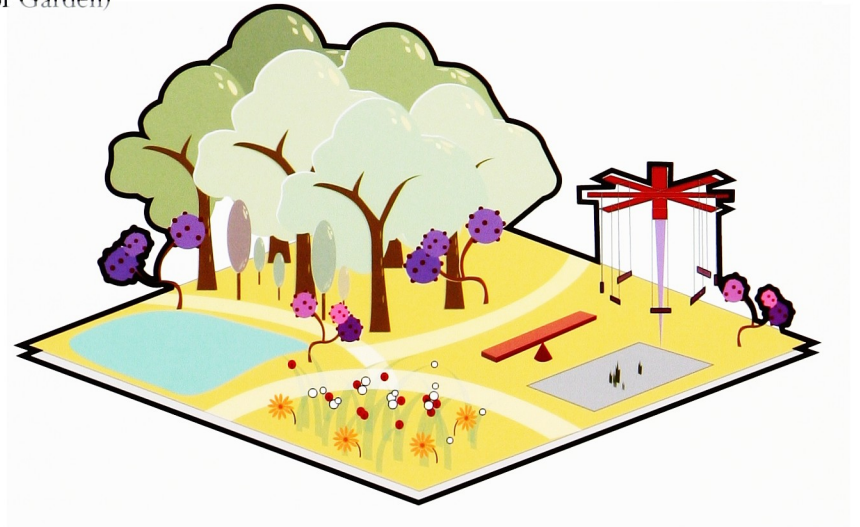




### ***Introduction page:***

Introduction Page provides viewers a straightforward idea of my objective to create the Vector Garden. A small size map shows the appearance of Vector Garden, and the principal theme of each park. By clicking each area or entering project button, the viewers can start exploiting Vector Garden!

(Figure 12:Small Map of Vector Garden)



(Figure 13: Introduction page)





***Eastpark:***

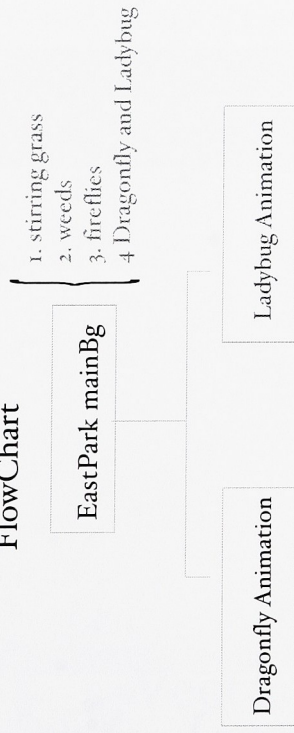
Eastpark is to portray an arboretum where there is grass and a bunch of insects abiding around. Instead of having a variety of insects; I only designed a dragonfly and a ladybug to represent all insects. It helps simplify the EastPark interface and users would pay more attention to its surrounding environment as well. In addition, viewers will be surprised when they discover the insects unexpectedly. Moreover, after clicking both symbols, the viewers will be suddenly falling into a fantastic fairy world with flying fish, colorful rainbows, shiny stars, even dancing lambs, such as a little child discovering amazing creatures.

Structure

(Figure 14: Details of EastPark)

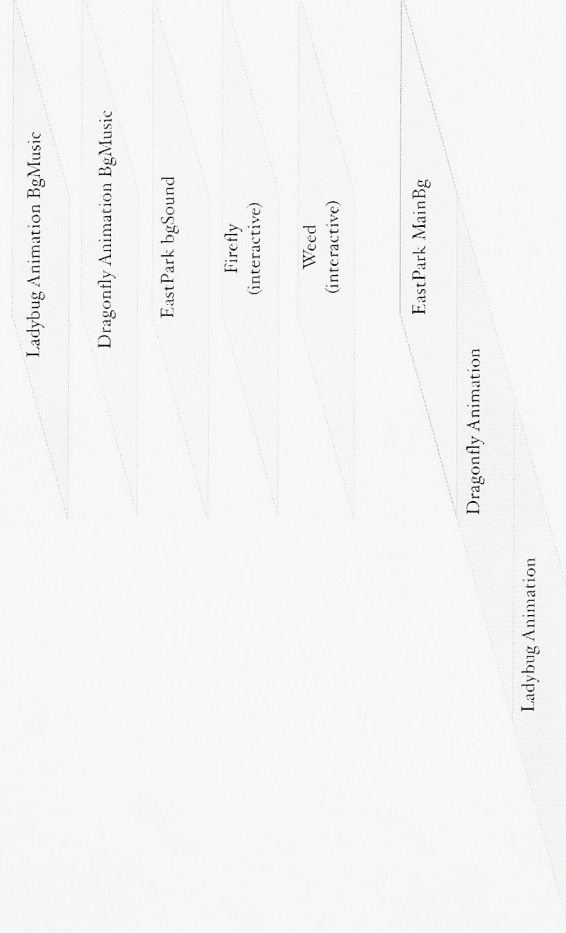
# EastPark

## FlowChart



## Vector Garden EastPark

### Component System Architecture



Appearance

(Figure 15: Photoshop Sketch of EastPark)



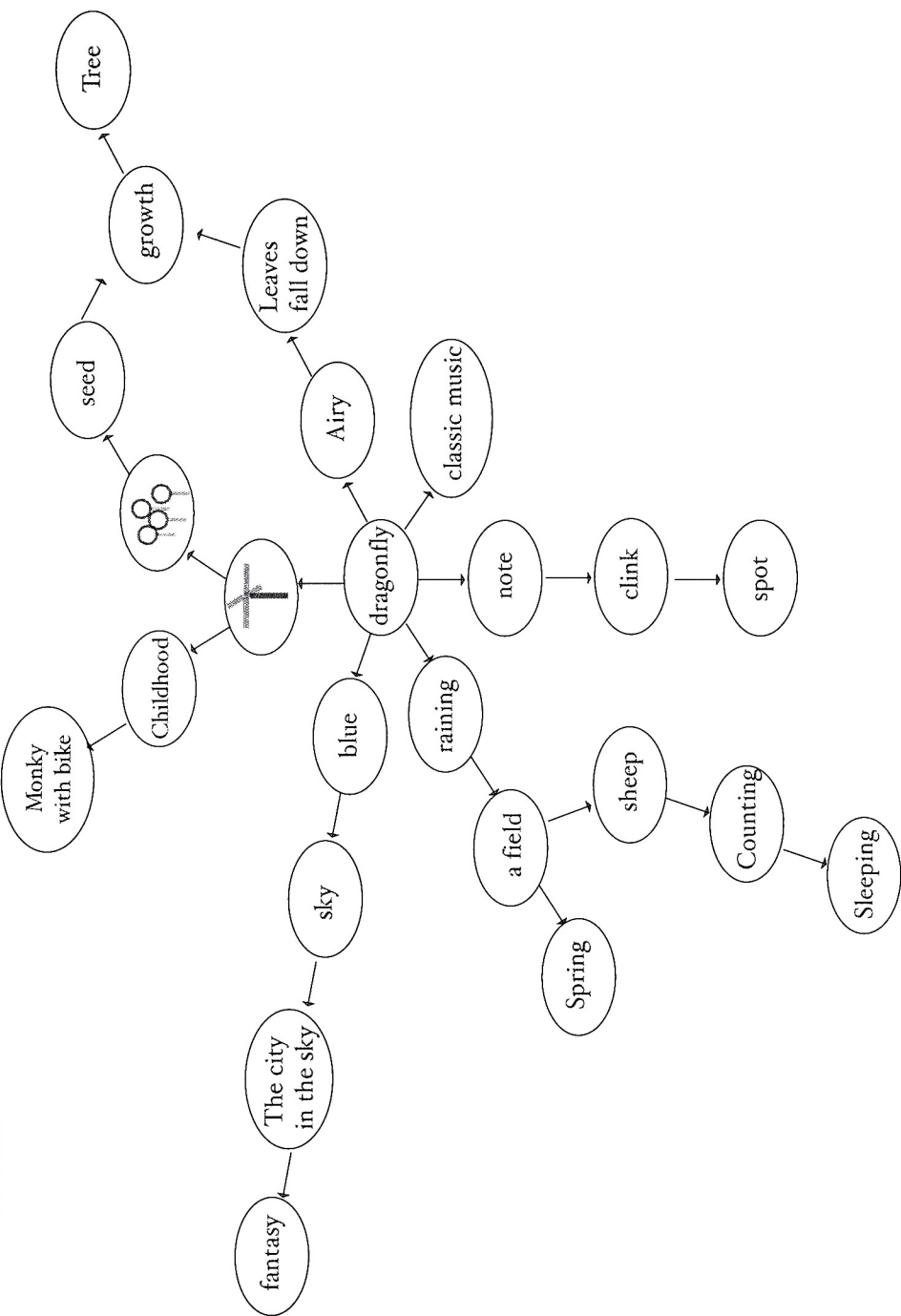
(Figure 16: Final Interface of EastPark)





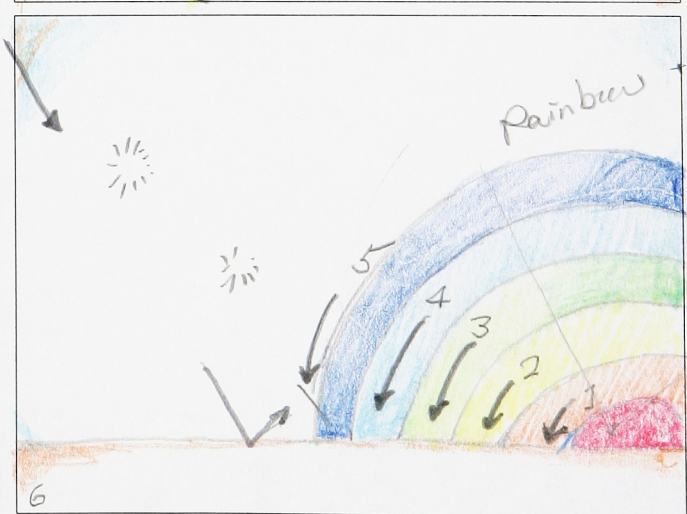
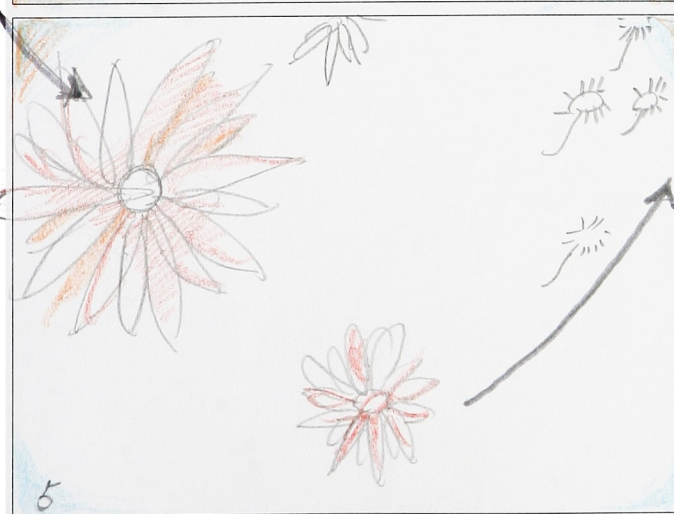
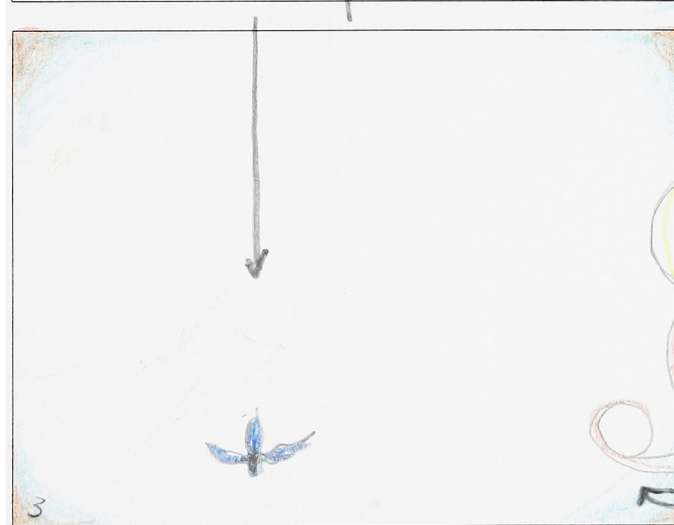
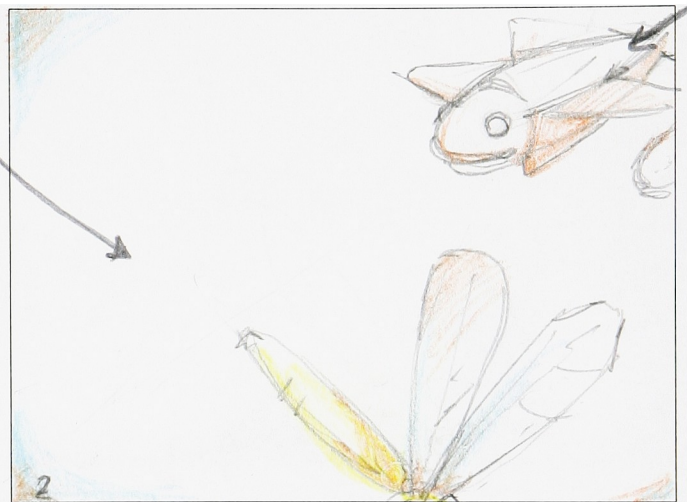
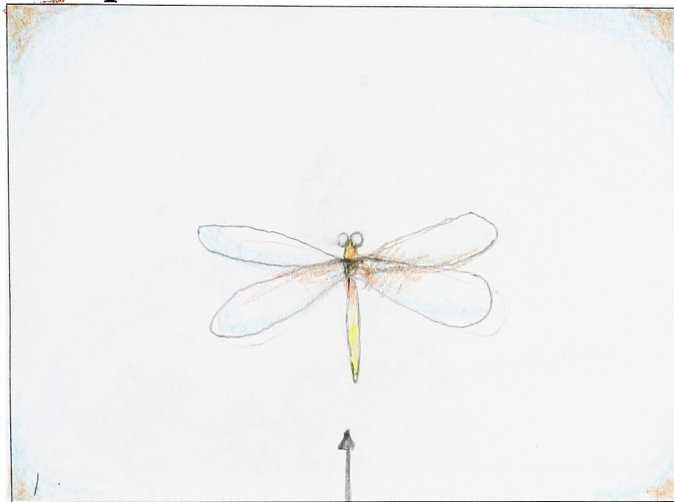
Storyboard of EastPark Animation  
(Figure 17: Mind map of Dragonfly Animation)

Vector Garden  
Dragonfly Animation  
MindMap



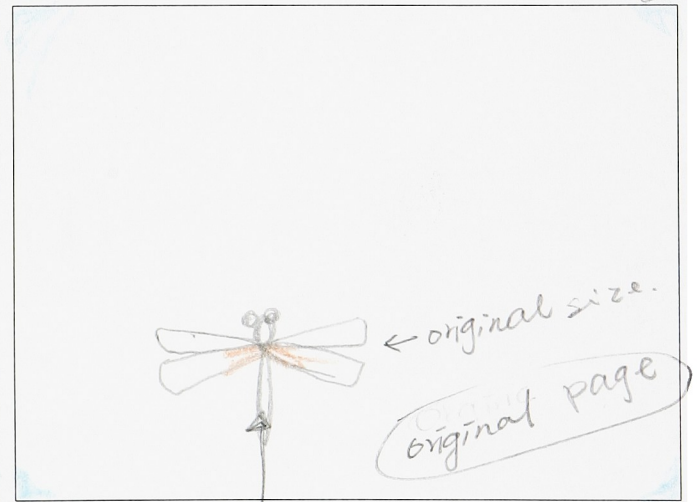
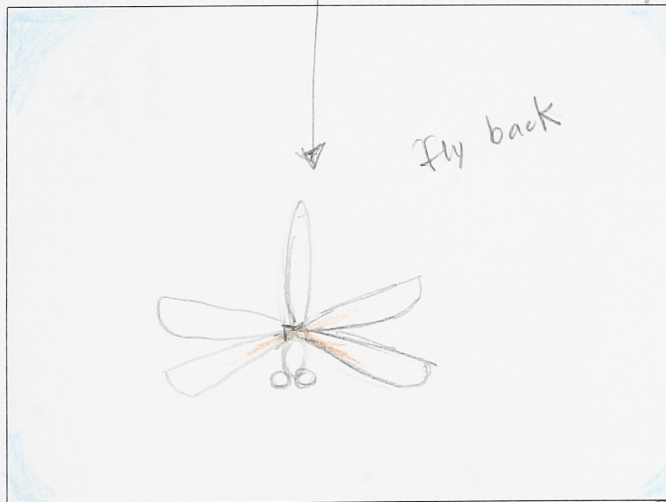
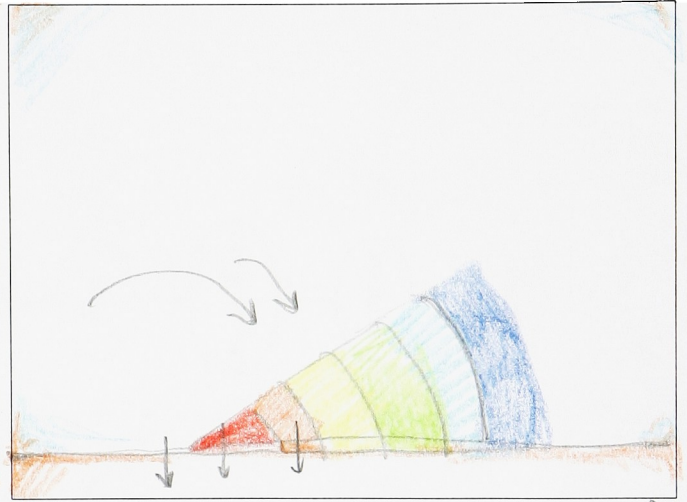
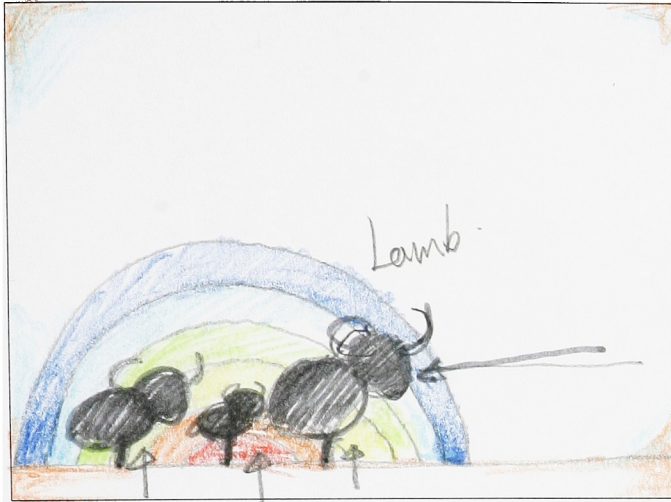
# Vector Garden

## Dragonfly Animation Script



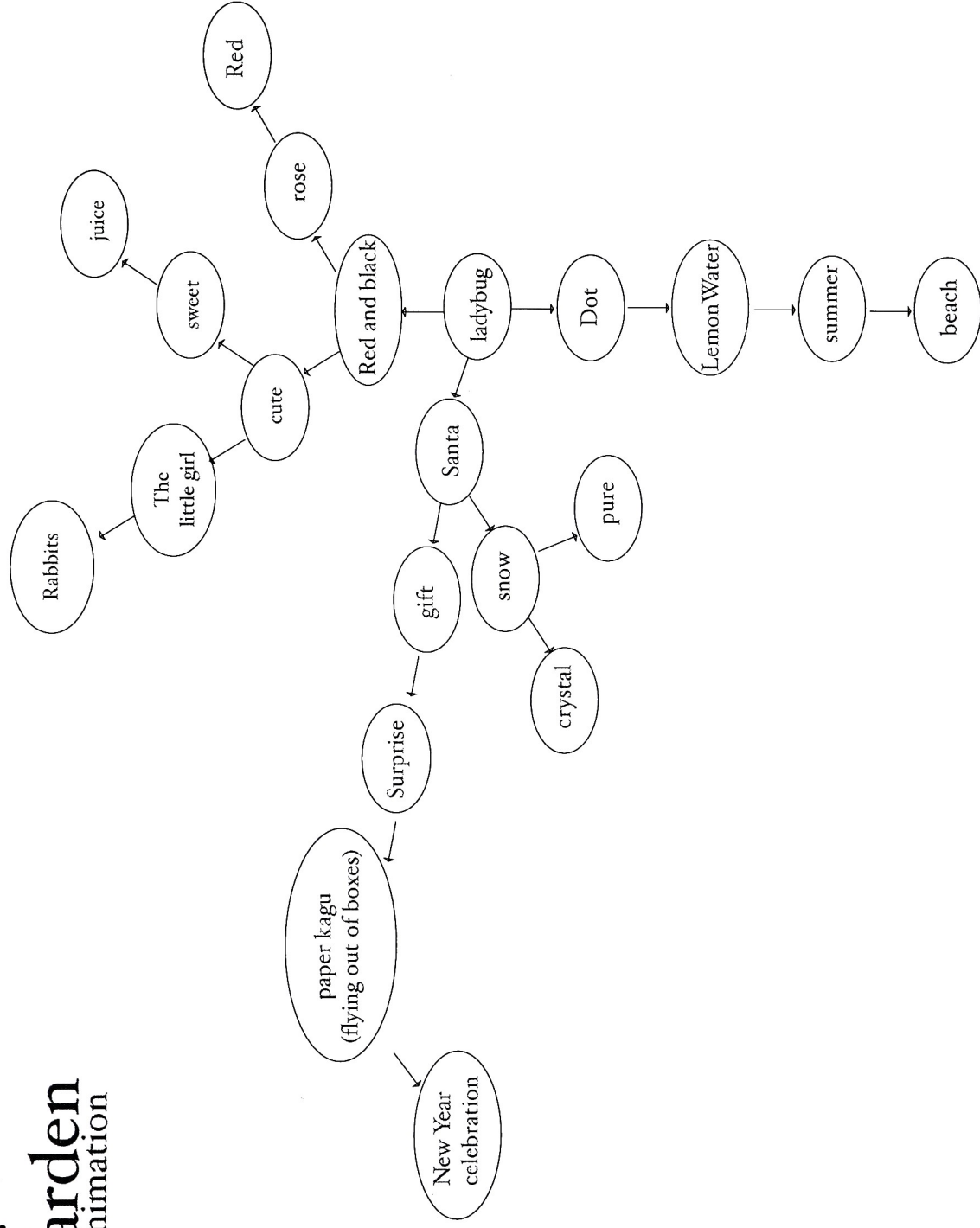
# Vector Garden

## Dragonfly Animation Script



(Figure 19: Mind map of Ladybug Animation)

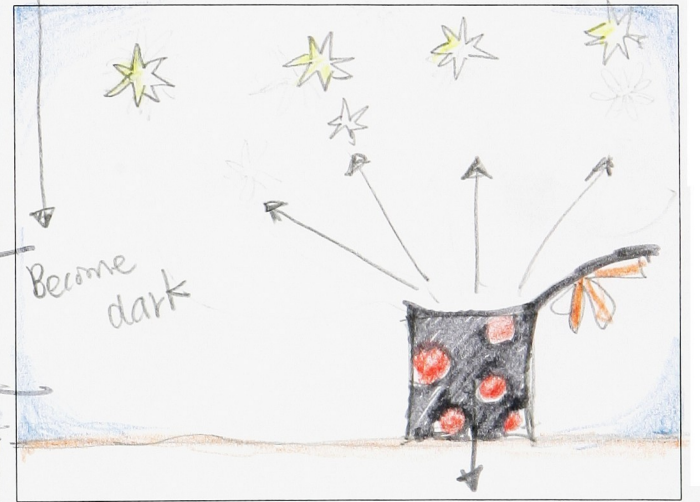
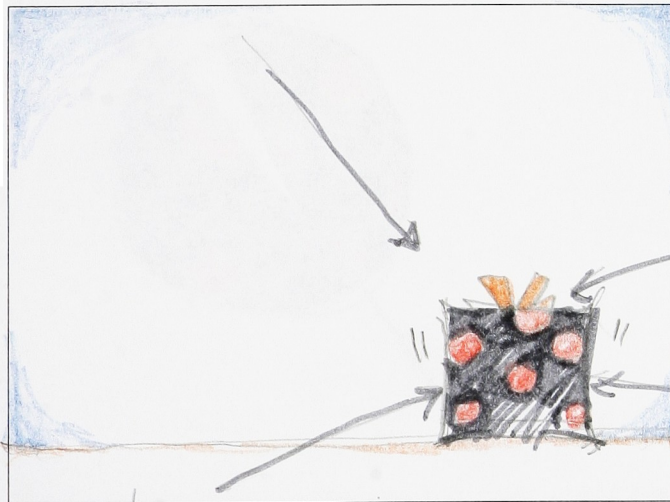
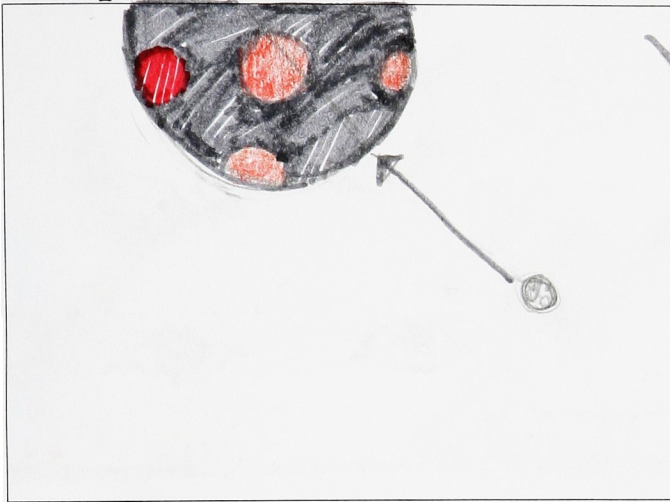
# Vector Garden Ladybug Animation MindMap





# Vector Garden

Ladybug  
Dragonfly Animation  
Script

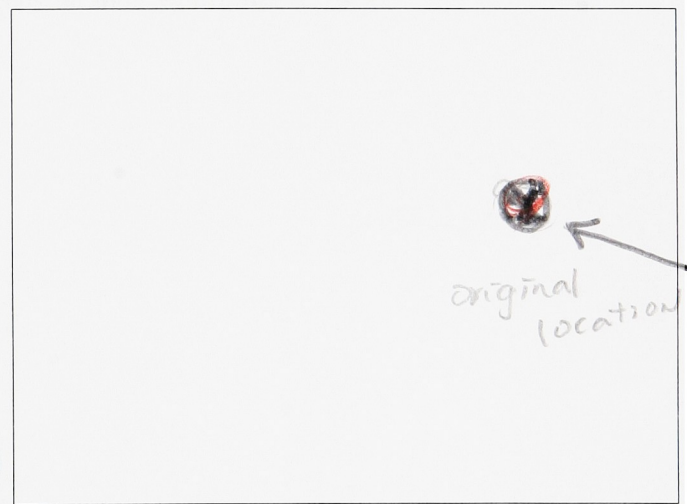
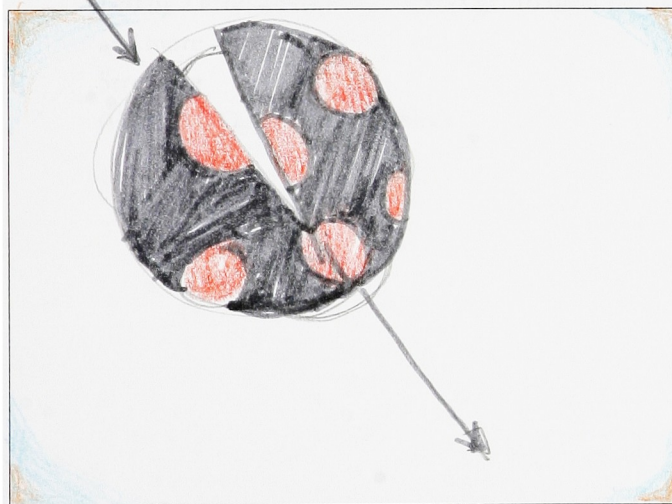
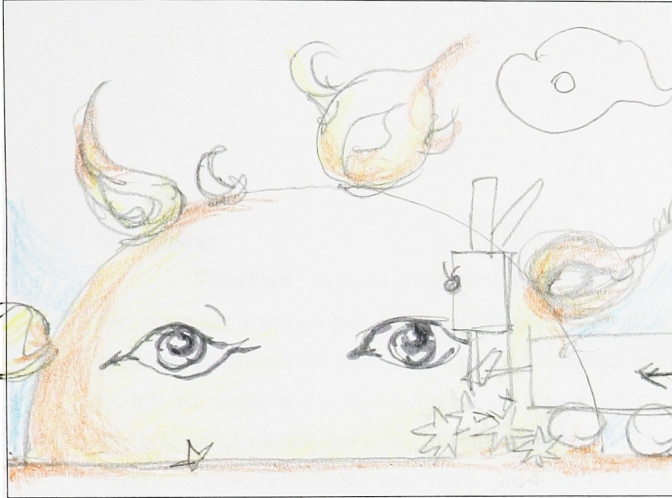


STAR falling down  
become flowers



# Vector Garden

## Ladybug Animation Script



***Westpark:***

WestPark depicts a viewer standing in the far distance and studying the lives of a forest under a telescope. There are three symbols: a monkey hanging to a tree branch, a fish growing up from fish tree, and a group of flying cows. These three images replace birds, which are supposed to be living in the forest. Using the mouse represents the movement of the telescope to discover the lives hidden by the trees. Furthermore, the animation named "Fairy's Adventure" has a narrative tale based on the story named "Alice in Wonderland". Led by a little lovely fairy, viewers get to meet her friends: Sir Monkey, Mr. and Ms. Bird and more.

Structure

(Figure 21: Details of WestPark)

# WestPark

## FlowChart

- 1. Forest Scene
- 2. Swarm
- 3. Smoke
- 4. "Fairy Adventure" Animation
- 5. Mokey, Fish Tree, Flying Cow

WestPark mainBg

Fairy Adventure Animation

# Vector Garden WestPark

## Component System Architecture

Fairy Adventure Animation BgMusic

WestPark bgSound

Smoke  
(interactive)

Swarm  
(interactive)

WestPark MainPg

Fairy Adventure Animation



## Appearance

(Figure 22: Photoshop Sketch of WestPark)

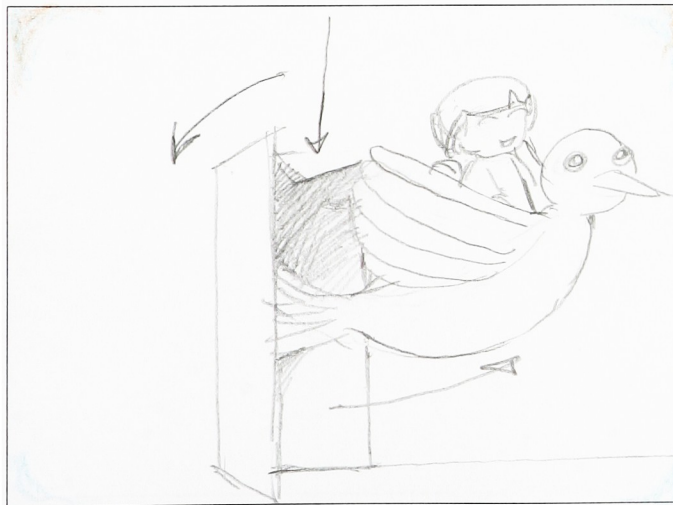
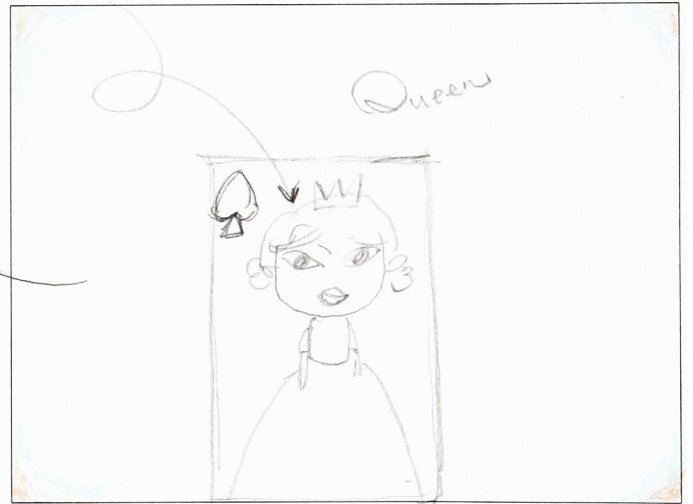
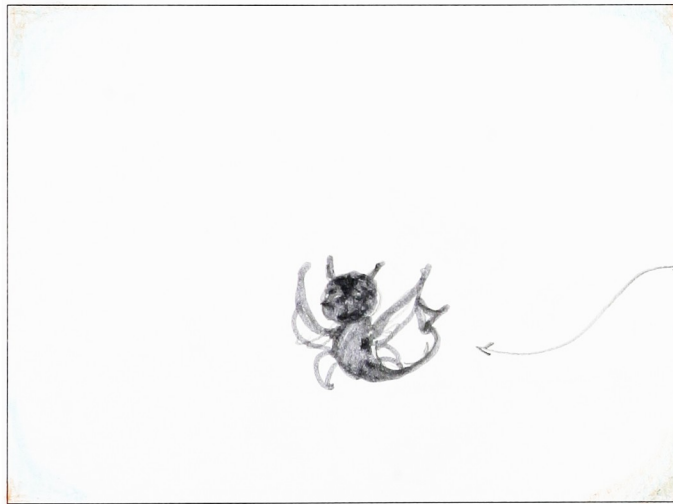
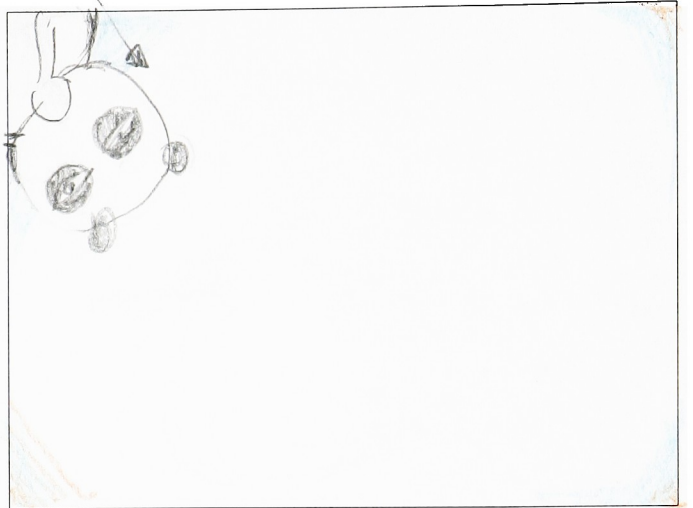


(Figure 23: Final Interface Design of WestPark)



# Vector Garden

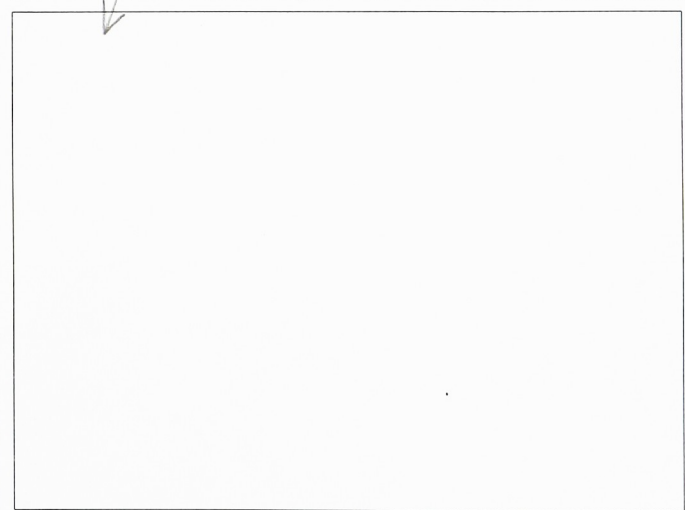
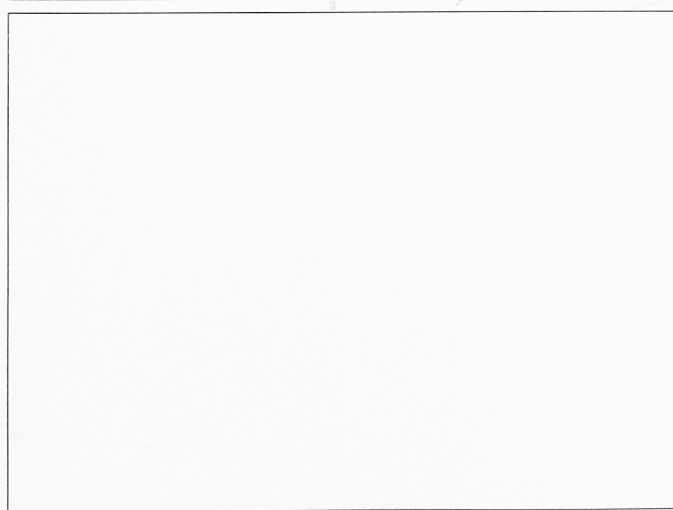
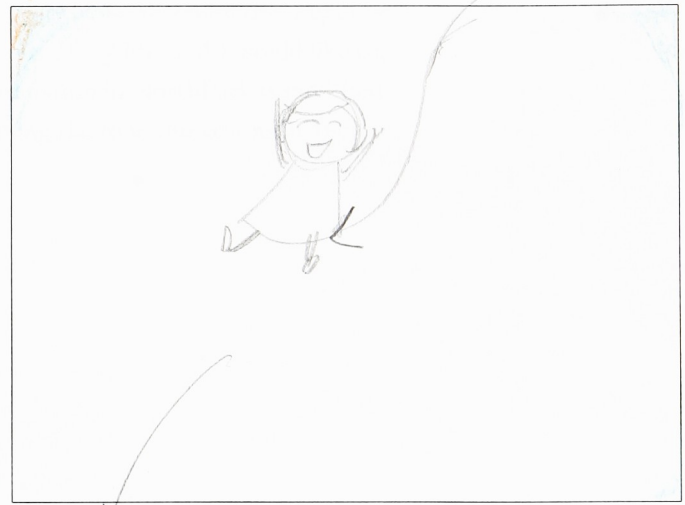
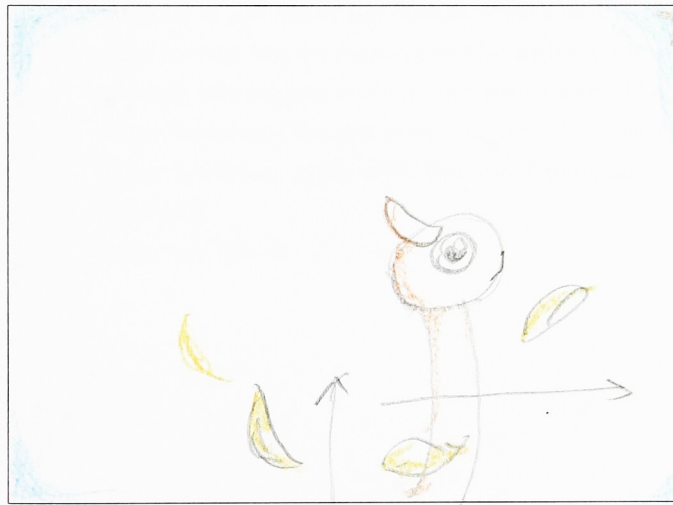
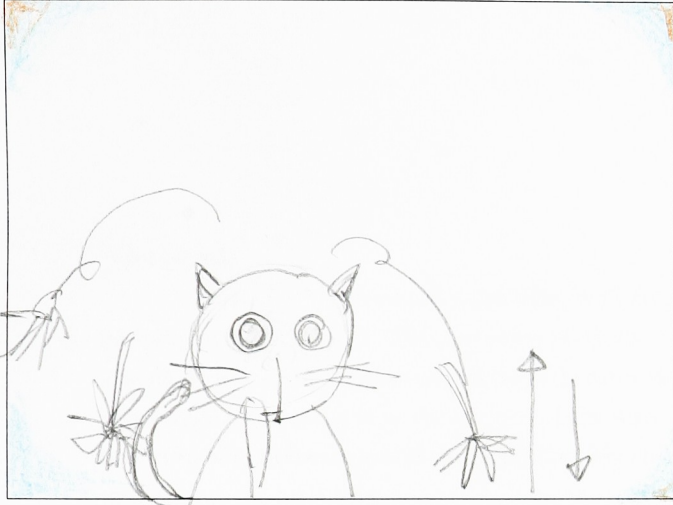
## Fairy Adventure Animation Script



grow flowers

# Vector Garden

## Fairy Adventure Animation Script





***Northpark:***

NorthPark has a small pond filled with frogs, magnolia, wrinkles, and small fish jumping out of the water. The pond also reminds me of my childhood. I always passed by a small pond near my elementary school. In rainy days, the pond would be filled with small bugs afloat on or near the surface of the water or around the pond. There were beautiful wild flowers around the pond too. My childhood memory actually inspires me to design those little bugs swimming near the surface of the pond. Small little bugs are jumping in and out of the flowers when a mouse rolls over them. My childhood might be gone forever, but my memory will be with me for the rest of my life, and I would like to, through this project, share it with the viewers. The animation in NorthPark is modified from the famous Russian novel: the frog Princess. Among the four animations in Vector Garden, this one is the most active and amusing.

Structure

(Figure 25: Details of NorthPark)

# NorthPark

## FlowChart

1. Pond Scene
2. buds-Interactive MovieClip
3. baby frogs
- 4 Fish follows the mouse
5. Frog Princess Animation

NorthPark mainBg

Frog Princess  
Animation

## Vector Garden NorthPark

### Component System Architecture

Frog Princess Animation bgMusic

NorthPark bgSound

Fish  
(interactive)

Baby Frogs  
(interactive)

NorthPark MainBg

Frog Princess Animation



## Appearance

(Figure 26: Photoshop Sketch of NorthPark)

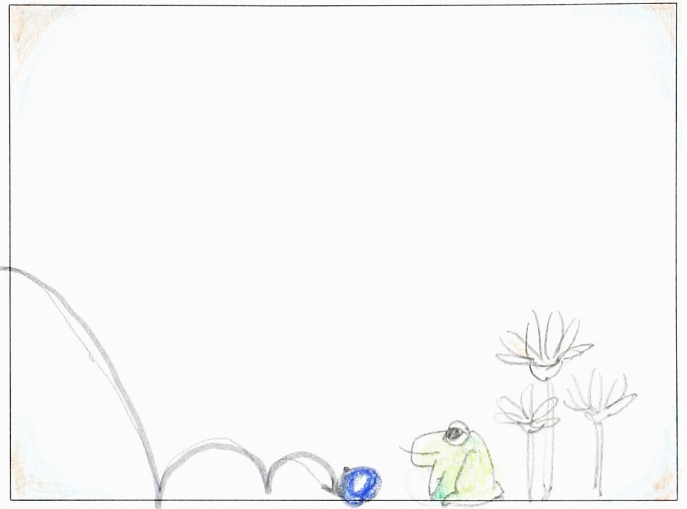
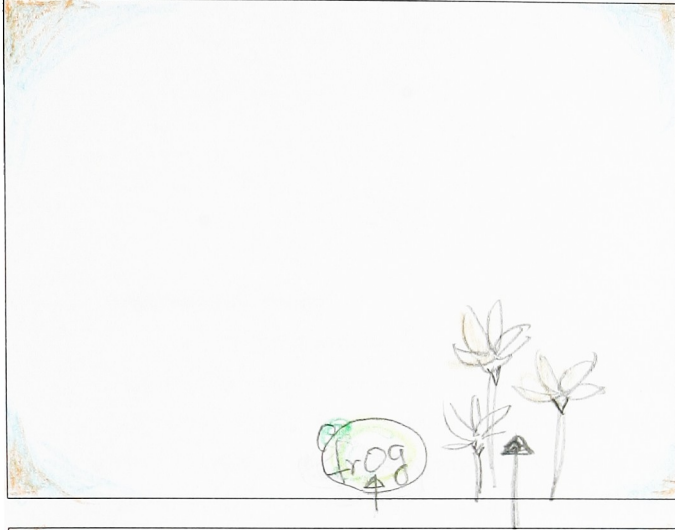


(Figure 27: Final Interface Design of NorthPark)



# Vector Garden

## The Frog princess Animation Script



### ***Amusement Area:***

The Amusement Area is rather a more relaxing atmosphere, yet full of surprising actions. The purpose of Amusement Area is to create a scene in which viewers can experience with ActionScript. For instance, the users will notice the riders turning different directions corresponding to the movements of the mouse, also the branch behind the girl can grow automatically. Moreover, by clicking the stage, the bubble in the left upper corner will separate into many tiny bubbles. It is even more interesting that, when clicking the girl, she will lead the viewers to another garden inside of Vector Garden, named Flora Garden. Inside, the viewers can actually plant a flower that can grow. Unlike other areas, the Amusement Area is more charming with interactions and interface designing, such as the barking dog, evil black animal falling down and the no-mouth girl.

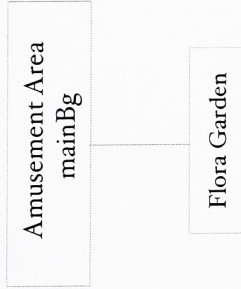
Structure

(Figure 29: Details of Amusement Area)

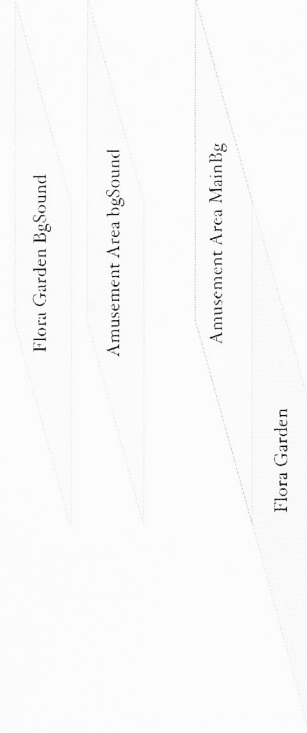


# Amusement Area FlowChart

- 1. The Main character-No-mouth Girl
- 2. Barking Dog
- 3. Black Evil Falling Down
- 4 More Interactive MovieClip
- 5. Amusement Riders



## Vector Garden Amusement Area Component System Architecture



(Figure 30: Illustrator Sketch of Amusement Area)



(Figure 31: Final Interface Design of Amusement Area)





(Figure 32: Flora Garden Sketch)



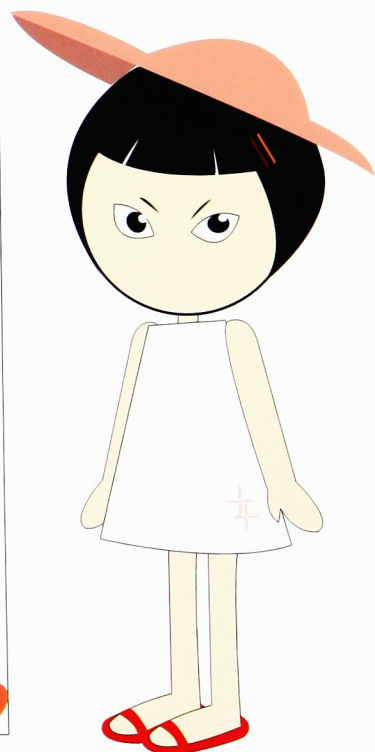
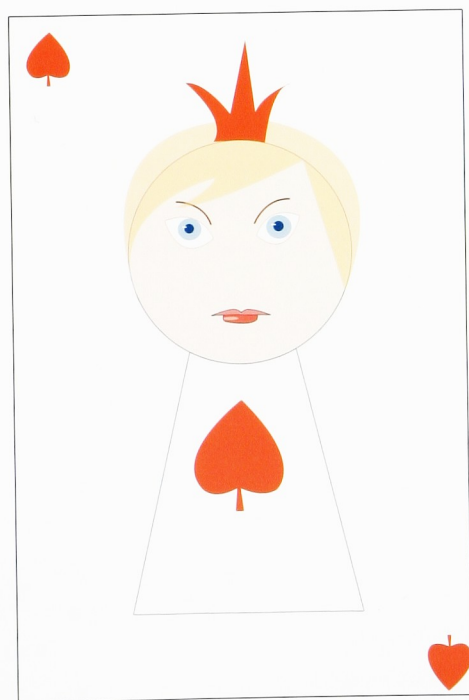
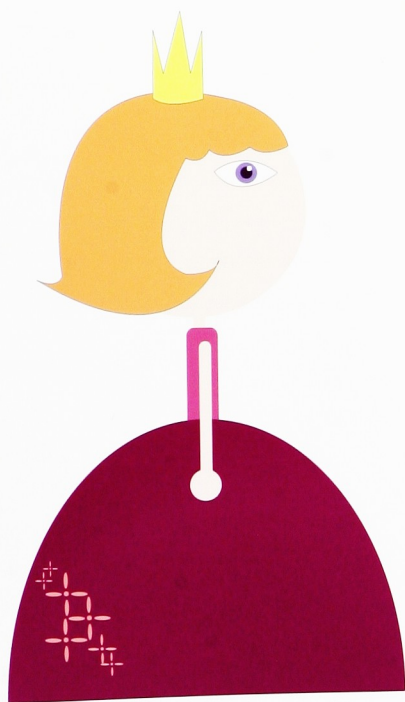
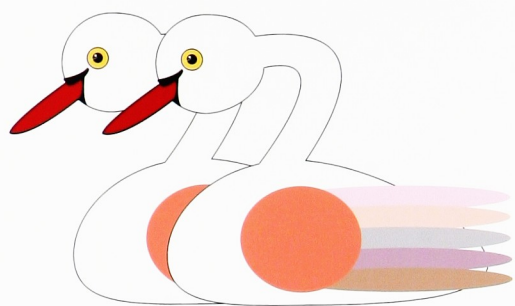
(Figure 33: Flora Garden Final Interface)





figure 34- Character Design in Vector Garden





## Technical Report

### 1. *Illustrator Export Swf*

One disadvantage about Flash paint tools is a lack of control over the device. To overcome such difficulty, and to produce complex yet interesting images, Adobe Illustrator was used as the primary drawing tool. With Illustrator, it is much easier to produce Vector graphics for the Web. In addition, it has additional features, such as exporting supports for SVG and Flash (SWF) files.

Almost all graphics in Vector Garden were produced with Illustrator and were later exported as Flash (SWF) symbols. When a symbol is used more than once in a drawing, its definition will be integrated only once in the Flash (SWF) file, with all other instances referring to the original definition. It produces files with significantly reduced sizes, making it much quicker to download and run files.

(Figure35: the example of a symbol I created in illustrator)



### 2. *Component System Architecture.*

(See Figure11 Above)

There are numerous ways to develop and deploy complex projects with Flash, but that flexibility has a major drawback. Many complex Flash files require enormous time to load on a VDT, depending on the speed of both software and hardware. The component system architecture, however, can break complex projects into separate modules or components that can be developed and loaded individually. The results are easier to update the files and expedited load times.

This architecture offers three major advantages:

- 1) Sites load more quickly because components load only when called.
- 2) Sites are easier to create because the files are smaller.
- 3) Sites are easier to update. The designer can quickly modify one aspect of a web site-navigation without changing every other area of the site.

The fundamental flash technology behind component system architecture is the *loadMovieNum()* action. It communicates with external Flash movies (SWF) and is combined with the original or root movie. This root movie sets the frame rate, the stage size, and then background color.

For example, Vector Garden's root movie is called Main's swf which sets up the 50-frame rate, 800x600 stage size and dark green as background color. This root movie loads other external Flash movies.



### 3. Controlling the Movie Clip

Movie clips are a powerful resource. Its power comes from the myriad of properties, methods and events that are available to it. A simple example of how I use movie clip is making message boards that viewers can actually drag-and-drop around the stage

(Figure 35: message board on the introduction page)

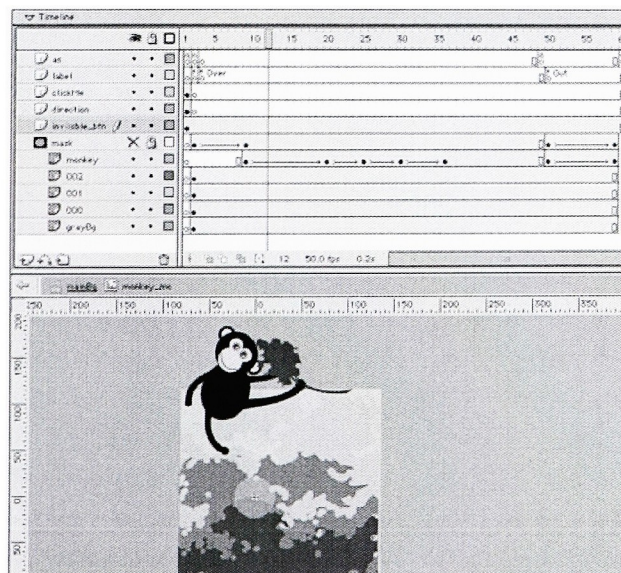


In this project I used a large amount of frame-by-frame movie clips that are dynamically generated. I selected the following examples to demonstrate my programming approach.

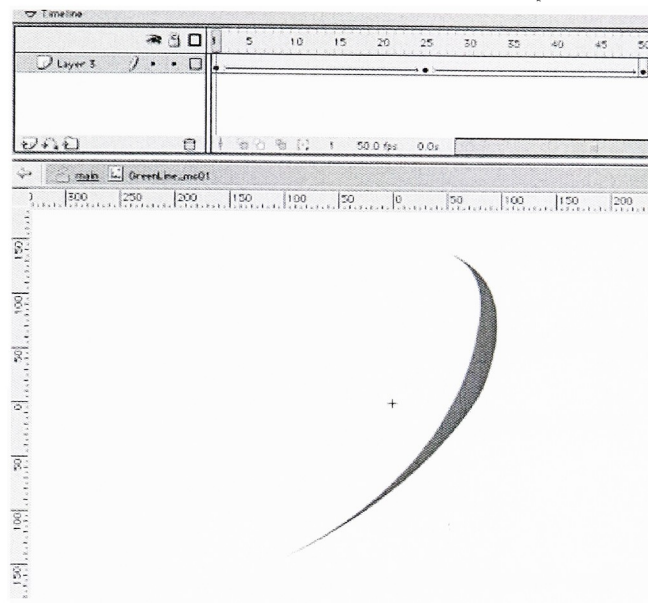
#### a) Frame-by-Frame Movie Clip

Frame-by-frame interactive movie clips include the pop-up circle scenes in WestPark like monkey, fish tree and flying cow. In NorthPark, when the mouse rolls over them, the flower starts booming and unexpected things will happen, such as a penguin, balloon and bluebird jumping up from the flower. The girl in Amusement Area who can walk and lead the users to the Flora Garden if she is clicked; also the Evil Black Creature Blue Bird, and the barking dog as well

(Figure 36: Frame-by-Frame Interactive Movie Clip)



Frame-by-frame graphic movie clips are the ones I use a lot in my background. For example, the whole stirring grasses in Vector Garden (Figure 37: Frame-by-Frame Graphic Movie Clip)



#### b) Dynamically generated Movie Clip

I created a group of movie clips generated by ActionScript dynamically, such as the stirring weeds controlled by mouse movement in EastPark; the fireflies flying around the stage in EastPark; the string of smoke and a group of flies in WestPark; the baby frogs in Northpark; and the bouncing bubbles and rotating Rides in Amusement Area.

The techniques I used are `duplicateMovieClip()`; `attachMovie()`; `createEmptyMovieClip()`; `removeMovieClip()`.

#### *Duplicate movie clips ;Attaching movie clips; Creating empty movie clips*

Duplicating movie clips, an exact replication of an instance on the stage, is created in the same position as the original. Duplicated movie-clip instances are given their own unique names, as well as a specific depth level for each individual instance. It is common to duplicate movie clips by using looping functions that append successive numbers to the instance name, and assign depth levels automatically. The technique of duplicating movie clips is only used for existing movie clips. It may not be convenient should I want to position a new movie clip from the library dynamically.

With `attachMovie()`, I could create new instances of movie clips from the library and attach them to existing movie-clip instances already on the stage or the root Timeline. The attached movie will not replace the original, but actually becomes part of the movie-clip in a parent-child relationship. For example, if a movie clip is attached to the root Timeline, the target path will be `_root.attach` (which instance)

When attaching a movie clip, I had to prepare a movie-clip symbol in the library. It has to be created, assigned an identifier, then will be exported ActionScrip. Each newly created movie clip will be given a name and depth level.

Take Weed.swf (in EastPark) for an instance:

Show Case 1:

```
for (i=0; i<=total_num; i++) { // duplicate movie clip
    attachMovie("dot", "dot"+i, i);
    // attach to a empty movie clip and give it a unique name and depth
    level.
    myDot = _root["dot"+i];
    myDot._x = random(myBounds.xMax-myBounds.xMin)+100;
    myDot._y = random((myBounds.yMax-myBounds.yMin)-60)+50;
}
```

Show case 2: The fireflies ( in WestPark) Attach ActionScript:

```
count++;
var myFly = this.attachMovie("fly", "fly"+count, count);
myFly._x = Math.random()*stageWidth;
myFly._y = Math.random()*stageHeight;
```

Show case 3: The baby frog(in NorthPark) Attach ActionScript:

```
var creatures = random(5)+8;
for (i=0; i<=creatures; i++) {
    attachMovie("cell", "cell"+i, i);
}
```

### *Removing Movie Clips Dynamically*

I have to delete movie-clip instances that have been duplicated or attached.

Show case 4: Example of how I remove the-clip from WestPark to “Fairy Adventure” animation. I need to remove the attach movie-clips which I created on the WestPark main page.

```
next.onPress = function() {
    // Next is a button's properties which tell the movie go to play
    frame named "Allice"
    gotoAndPlay("Allice");
    for (x=0; x<= 20; x++){
        var name= "fly_" + x;
        removeMovieClip(_root[name]);
    }
};
```

Therefore while animation start playing, the swarm of flies disappears. In this example, I also use one important ActionScript: function. The use of function is a significant building block of re-usable programming. Often, we need to write code to do a certain thing over and over again. Functions eliminate the tedium and the duplication of code by putting it in one place where we can call on it to do its job from anywhere and at any time.



In above example, I create an anonymous function. Anonymous functions do not work alone and must be assigned to another object.

#### c) Variable Control

As Flash movie displays graphics, animation or plays sounds, a lot can be happening behind the scenes, unapparent to the viewers. The Flash document may be tracking many bits of information; such as the number of lives a player has left in a game or a users' login name and password. Getting and storing this information requires variables, which are containers for information. Variables involve complex interactivity, because they create scenarios based on information that changes.

Here is an example of how I control variables in my project.

Show case 5: Take weeds for example,

```
onClipEvent (load) {  
    var follow = false;  
    var min_dist = 50;  
    var max_move = 120;  
    var force = 1.4;  
    var a = 3;  
    var d = 1.6;  
    var newX = _parent._x;  
    var newY = _parent._y;  
    var myXspeed = 0;  
    var myYspeed = 0;  
    _root.attachMovie("line", "line"+_root.level, _root.level);  
    myLine = _root["line"+_root.level];  
    _root.level++;  
    var line_x = random(_root.myBounds.xMax -  
_root.myBounds.xMin);  
}
```

Above is how I put information into a variable: to assign a value to variable. A variable can hold any kind of information, such as a number, letters, a true or false value, or even a reference to another variable.

#### d) Conditional statement

I modify variables and use them in expressions- formulas that can combine variables with other variables and values- and then test the information against certain conditions to determine how the Flash movie will unfold. This test is done in conditional statements, which control the flow of information. Conditional statements are the decision-makers of Flash movie. They evaluate information that comes in and then tell Flash what to do based on that information. The logic of conditional statements is like this sentence "if abc (the condition) is true, then do xyz (the consequence)"



Here is an example of how I use conditional statement in Weeds'   
ActionScript

Show case 6: This demo is showing how the weeds change   
direction according to the mouse distance and direction.

```
onClipEvent (enterFrame) {  
    // Within an onEnterFrame handler, we can monitor the status of  
the variable continuously with an if statement.  
    myXspeed = ((_parent._x-newX)/a+myXspeed)/d;  
    myYspeed = ((_parent._y-newY)/a+myYspeed)/d;  
    // check mouse distance  
    if (Math.abs(_parent._x-_root._xmouse)<min_dist &&  
Math.abs(_parent._y-_root._ymouse)<min_dist) {  
        follow = true;  
        this.gotoAndStop(2);  
    } else if (Math.abs(_parent._x-newX)>max_move ||  
Math.abs(_parent._y-newY)>max_move) {  
        follow = false;  
        this.gotoAndStop(1);  
    }  
    if (follow) {  
        myXSpeed += (_parent._x-_root._xmouse)/force;  
        myYSpeed += (_parent._y-_root._ymouse)/force;  
    }  
    _parent._x += myXspeed;  
    _parent._y += myYspeed;  
    // adjust line  
    myLine._x = _parent._x;  
    myLine._y = _parent._y;  
    myLine._xscale = line_x - _parent._x;  
    myLine._yscale = (_root.myBounds.yMax-_root.myBounds.yMin)-  
_parent._y;  
    myLine._alpha = 20;  
}  
onClipEvent(mouseDown) {  
    newX = random(_root.myBounds.xMax-_root.myBounds.xMin-  
50)+26;  
    newY = random(_root.myBounds.yMax-_root.myBounds.yMin-  
60)+31;  
}
```

# Analysis

## Troubleshooting:

### ***Vector Graphics Slow Down the render Speed***

Vector Graphics are smaller as compared to files in other formats. They shift the burden of file size to the rendering computer's processor, rather than tying it to the physical height and width of the image. Therefore, the complexity of the image determines its size - the more lines and polygons, the bigger the image would be. So a 1-inch-square rendering of an aircraft carrier is a bigger download job than a full-screen Bitmaps.

To make movement more smoothly and perfectly, Flash application will try to render each area on the screen. If a transparent color is placed on top of another color, Flash application will calculate two colors at the same time. In other words, the more transparent colors, the more memory a computer uses for calculating and processing.

Vector Garden images are composed with complicated lines and shapes. Besides, I applied a great different amount of transparency in graphics. I had encountered a major problem that the speed became very slow while the computer tried to render each images on the monitor, though I tried to test it in brand-new G4 Macintosh.

To make my project run gently and smoothly on different computers, some transparent colors were removed, which I thought were the best matching for the images, to reduce the complicated shapes. Diminishing the technological problems and keeping my original aesthetics once became the first major concern in Vector Garden.

After reducing some lines and polygons and avoiding using transparent colors, the speed was accelerated yet it was still challenging to accommodate computers with different speeds. Sometimes animations are still going on but the music already stopped, or if the computer is too slow, nothing would happen when clicked "click me" - something will happen, just take a longer while.

It was frustrating that I could not keep original complicated images in Flash since Vector graphics can only come as close as cartoon-style drawings.

### ***Music I chose has other meanings for people from other cultures***

I chose a song name "Skiddy Wo" as the background music for the ladybug animation. It is a swing-latin hybrid released from Swing-O-Matics. But some people disagree that it is suitable for animations, since it reminds them of "I Dream of Jeannie", a famous American TV Comedy. "Skiddy Wo" was chosen as the background music because of its vibrant melody, and I had created the whole movement following its rhythm. I eventually was forced to select other music, which was very time consuming to find the right one as the background music for the ladybug animation.

### ***800\*600 Resolution is too big***

Most people who tested my projects in Taiwan had criticized the oversized demo. The original setting for my monitor screen display was 1280x1024, while 800x600 stage size might be the perfect size. I did not realize that most computer users usually adjust their screen resolution to 800x600 or 1024x768. Necessary adjustments are required for future projects.

### **Successes**

I am happy and confident with this project. It helped me to learn more about myself, while applying my professional knowledge: drawing my stories, dreams and imagination. Vector Garden reflects my imaginary world in a showcase with mysterious beauty rendering in lush, dense colors and crystalline lines. I was inspired by a famous novel named "Alice in Wonderland" by Louis Carroll which is about a fairyland where life has its own rules. As Alice, a little girl, begins to understand these rules, she discovers a wonderland garden filled with beauty. I would like to share my vision and inspiration with my viewers, and they will love my Vector Garden.

**Missing Page**



**Missing Page**

**Missing Page**

**Missing Page**

## Closing Observation

I am very pleased with this project and satisfied with the final outcome: Through programming, to create visual experiments based on dynamic motions and interactions. There are still some deficiencies that need improvement and some minor problems that cannot be solved immediately. However, during the process, I have discovered and learned my talents and strength, of course, my weakness and inadequacy. It will be a continuous process.

Below concludes my observation from the process:

*Multimedia Designers must possess fair comprehension of programming:*

Programming is crucial and fundamental to contributing to superior online interactivity, providing users with better control over interactions that are supported by dynamic content can be accomplished effectively through creative programming. Pre-arranged interactions cannot continuously make themselves interesting. Dynamic interactions certainly are greater techniques and approaches to carry on the interest of the users.

I had encountered several programming related problems during the whole process. I was virtually forced to design frame-by-frame animations instead, or simplify the scripting programming so the graphics would run smoothly, and ultimately I decided to focus on and emphasize more graphic designing over programming. It has revealed one possible future obstacle: lack of sufficient programming skills and knowledge.

Again, designers need to be sufficient in programming, otherwise it will inevitably constraint their designing concepts. I strongly believe that creativity is necessary for programmers to carry out their work successfully, but designers will always be more superior in envisioning and creating both the realistic and impossible. They are more than just designers, also artists. Certainly, designers must be able to demonstrate programming proficiency. It will never be a perfect job otherwise. It is impractical to compare a designer to a programmer, but integration of both designing and programming will be an imminent and on going professional practice.

In conclusion, I believe that all professions had begun with the original immature ideas from our amazing creativities and imaginations. My Vector Garden is defined and characterized by graphic designing. It demonstrates my professional skills and knowledge in graphic designing, but indeed mirrors my very own personality, imagination and vision.



## **Special Thanks to**

Here I want to say thank you to some people.

To my parents:

Thanks for supporting me to accomplish this study. You made my dream come true.

To my advisor committee professors: Jim, Chris and Adam:

Thanks for keep giving me feedback and good constructive criticism. You make me feel confident.

To my dear classmate and good friends: Pi-fang, Claudia, Len, Be and Oou.

Thanks for giving me so good opinions and suggestion. I feel very lucky to be your friend and classmate.

To my dear Jing:

Thanks for taking your time to proof and correct my poor English. This thesis document would not complete without your help.

# Resource

## Footnotes

1. Eduard Imhof, cartographic Relief Presentation (Berlin, 1982), Edited and translated by H. Steward from Imhof's Kartographische Geländearstellung (Berlin, 1965), p 72. Here what should be strictly cartographic and information design arguments are pushed too far toward a general theory of aesthetics, Mondrian, Malevich, and many others routinely violate the fourth rule; the problem is with the rule not Mondrian]
2. Original Article was released on  
<http://www.monkey.com/TX1/reference/styles/styles.htm>

## Online Sources

### **Research:**

#### **{Hotwired- Webmonkey}**

Vector Graphics

<http://hotwired.lycos.com/webmonkey/98/12/index0a.html>

#### **{MONKEYmedia}**

Five Styles of Interaction

<http://www.monkey.com/TX1/reference/styles/styles.htm>

#### **{Oculus Magazine}**

Jazz Primer for Rock People

By Craig Matthews

November 1995

<http://www.oculus.com/features/primers/jazz/jazz.html>

#### **{Sound Design}**

Stretching Sound to Help the Mind See

By Walter Murch

<http://www.filmsound.org/murch/stretching.html>

#### **{RGB Art Website}**

RGB's Basic Drawing Techniques – Understanding Perspective Drawings

<http://www.geocities.com/SoHo/Studios/3274/draw3.html>

## Experimental Design on the Web

**[<http://www.studiotimo.com/>]**

By Gicheol Lee

**[<http://www.uncontrol.com/>]**

By Manuel Tan

**[<http://www.setpixel.com/>]**

**{[www.deconcept.com](http://www.deconcept.com)}**

By Geoff Stearns

**[<http://surface.yugop.com/>]**

**{[www.flashkit.com](http://www.flashkit.com)}**

**{[www.macromedia.com](http://www.macromedia.com)}**

## The Implementation of Database Technology:

**{Macromedia Flash: Super Samurai}**

By Eric Dolecki, Mike Grundvig, Klaus Hougesen, Allan Kennedy, Jobe Makar, Til Mauder, Torben Nielsen, Max Oshman, Robertson Ramirez, Oliver Shaw, Geoff Stearns, Michael Brandon Williams

Publisher: Macromedia Press; Book and CD-ROM edition (2001)

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# Vector Garden

How to Play:

1. Insert the CD-ROM into CD-driver
2. Double-click "VectorGarden" in each "Thesis Project" folder

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by: Hsieh Lichun  
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